Rhinoceros Hornbill *(Buceros rhinoceros)*

Size: Body length, 80 - 90 cm **Weight:** 2 - 3 kg **Habitat:** Primary lowland and hill forests; also found in tall secondary and swamp forests **Surviving number:** Unknown

Photographed by Tim Laman

WILDLIFE AS CANON SEES IT

Jail birds. During nesting season, rhinoceros hornbills imprison the female in cavities in forest trees or limestone cliffs. Pairs use mud and droppings to construct a wall that "locks" her in through incubation and when nestlings are young. They leave a small hole, just large enough for the male to deliver food to his partner and chicks. This strategy protects the female and young at a vulnerable time, but the species is not safe from habitat destruction and hunting for food, trade and feathers.

As Canon sees it, images have the power to raise awareness of the threats facing endangered species and the natural environment, helping us make the world a better place.

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NATIONAL GEOGRAPHIC

Betty Webb, British intelligence, Bletchley Park

THE LAST VOICES OF WORLD WAR II

75 years after the end of history's deadliest war, survivors share their stories.

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Denmark, a nation of 406 islands, is largely surrounded by water and blessed with coastlines of all kinds.
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More than 66 million military men and women served in World War II, and countless civilians also figured in the war effort. To mark the 75th anniversary of the war's end, *National Geographic* shares portraits and stories of some of the last surviving witnesses.
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Take in the wonders of *National Parks of Europe*

About four decades after the United States created its first national park (Yellowstone), Sweden set aside nine wilderness areas, "and the rest of Europe then followed." So says this glorious guide to 460 parks, including the one above in Aberdeenshire, Scotland. Organized by region, *Complete National Parks of Europe* spotlights historic sites, cultural treasures, scenic hikes, flora, fauna, and more. The richly illustrated volume is available wherever books are sold.

BOOKS

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The latest edition of this best-selling kids' almanac brims with fun facts; games; features about animals, science, technology, conservation—even homework help. *Kids Almanac 2021* is available wherever books are sold.

TELEVISION

Savor adventure alongside this renowned chef

The second season of *Gordon Ramsay: Uncharted* follows the chef as he journeys off the beaten path. A new season returns Sunday, June 7, at 10/9c on National Geographic.

BOOKS

Discover the inside story of three key WWII leaders

Now in paperback: *The Allies: Roosevelt, Churchill, Stalin, and the Unlikely Alliance That Won World War II*. Mark the 75th anniversary of the war's end with this biography of the Allies' leaders, by *Forrest Gump* author Winston Groom. Available wherever books are sold.

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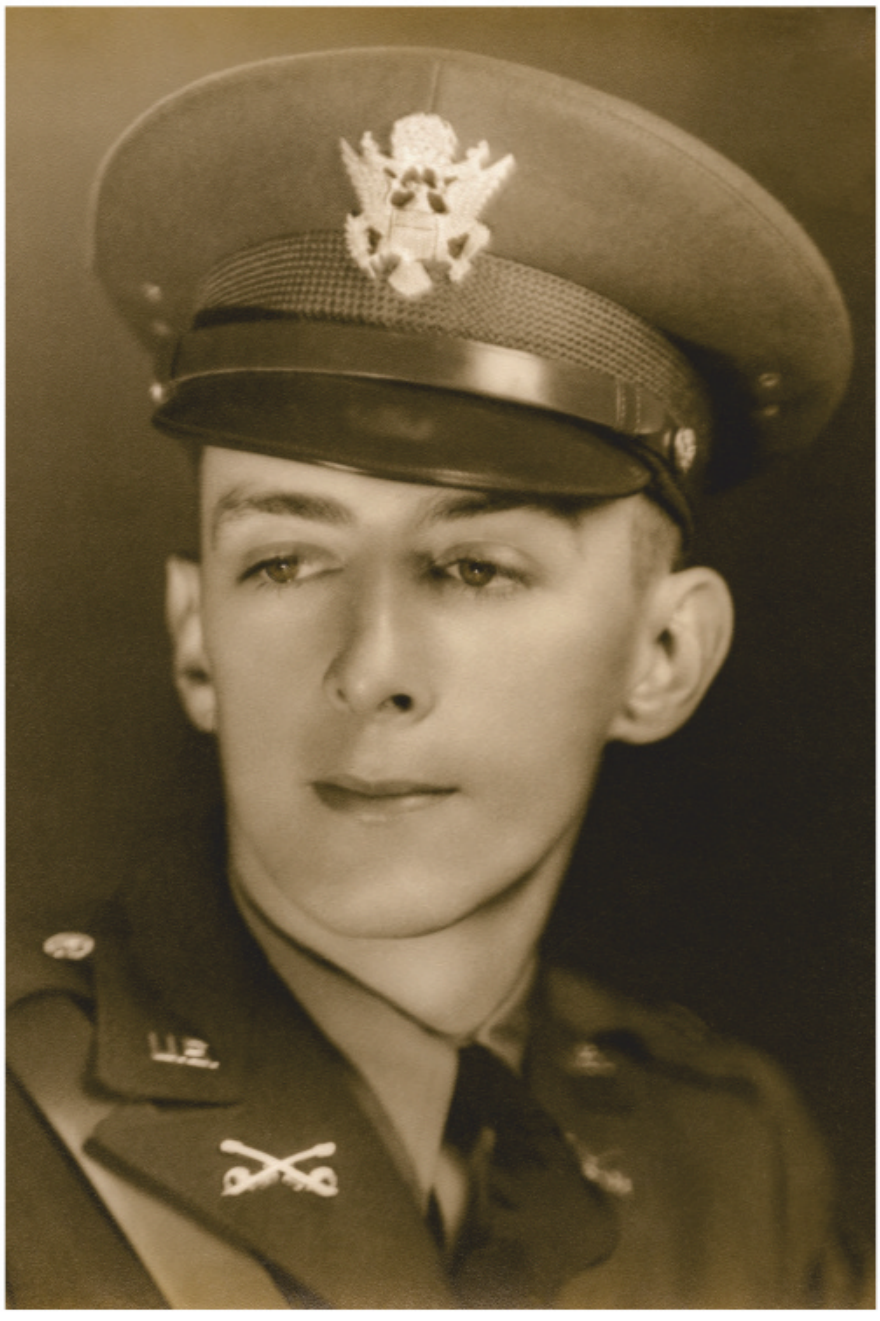
PHOTO: JIM RICHARDSON

WORLD WAR II
75 YEARS LATER

Sharing the Stories of Those Who Came Home

BY **SUSAN GOLDBERG**



First Lt. Robert C. Etnire, one of nearly 160,000 Allied troops who landed on Normandy beaches on D-Day

IN 2005, my husband, Geoffrey Etnire, and I went with his parents to visit Normandy, France. We knew that Geoff's father, Bob, had been involved in some way in D-Day, but like many men of his generation, he never spoke of it.

When asked for details about what happened, Bob would only say that he went over "later." No one pushed the point, and the family came to assume that "later" meant days or even weeks after the first D-Day landings on June 6, 1944.

Standing on Omaha Beach, we found out how wrong we were.

I knew I wasn't supposed to press Bob about his experiences in World War II. But on that windswept beach, amid what remains of German bunkers and with the steep cliffs towering behind us, my reporter's curiosity got the best of me.

"Bob, you went over 'later,' but when was that exactly?" I asked.

"Oh, about 11 o'clock in the morning," he replied.

"On D-Day itself?"

"Yes."

And that is how we found out—incredibly, when he was 85 years old—where Robert C. Etnire was on that fateful day. A first lieutenant in the 102nd Cavalry Reconnaissance Squadron (Mechanized), he was among nearly 160,000 American, British, and Canadian troops who took part in the largest seaborne invasion in history. He landed on Omaha Beach.

Thinking about it now, I can understand why this modest American patriot didn't want to talk about D-Day. By the time he arrived at 11 a.m., he must have stepped over the bodies of any number of the hundreds of American soldiers killed in the earlier

THE PARTICIPANTS WHO SURVIVED THAT CONFLICT ARE NOW MOSTLY IN THEIR 90s, AND IT'S IMPORTANT TO HEAR FROM THEM.

PHOTO: COURTESY GEOFFREY C. ETNIRE

waves of the Omaha assault. Perhaps he thought that, by comparison, he didn't have much to add.

Despite his silence, he never stopped thinking about that day.

After Bob died in 2015, at the age of 96, we found a yellowed piece of paper in plain sight in the top drawer of his desk. No one in the family could recall seeing it before. It was an official, typewritten list, dated May 31, 1945, of the officers and enlisted men in his squadron who "participated in the assault which secured the initial Normandy Beachhead, and are awarded the Bronze Service Arrowhead."

On the list of officers, Bob had drawn a circle around the names of the men who were killed that day; he put an X by the names of those who were wounded. Of the 29 officers listed, 12 were killed, according to Bob's circles. Six were wounded. His own name is highlighted in pink. I can't vouch for the accuracy of his casualty count, but it is abundantly clear that the war never left him.

So it is for the men and women we talked to for "The Last Voices of World War II," this issue's cover story commemorating the 75th anniversary of the end of the war. The participants who survived that conflict are now mostly in their 90s, and it's important to hear from them—a first-person telling that soon will pass to the ages. (One of the men we photographed for this story died before we went to press.)

We wanted to provide more than an American perspective. As a result, you will hear Russian, German, British, and Japanese voices as well. Their experiences are different but have something in common: For them as for Bob, the war never really goes away.

A Russian man vividly remembers the day "my kindergarten became my first orphanage." A captured British paratrooper, in league with another prisoner of war, sabotaged the factory where they worked as forced labor. He was awaiting the firing squad in a Dresden prison when Allied planes firebombed the city and he escaped.

A Japanese veteran recalls how he and other young men "were sent to die for the emperor and imperial nation, and everyone acted like we believed in it." But at the moment of death, he says, "I never heard anyone calling the emperor"—only the names of loved ones.

A German woman we interviewed described her shame at her Nazi father's role in the war, and how she and her family nearly starved after the advancing Red Army cut off access to her town. Today she visits schools in Hamburg to warn of a peril she sees rising again. "People haven't learned," she says. "It's horrifying that neo-Nazis are back, and not just in Germany."

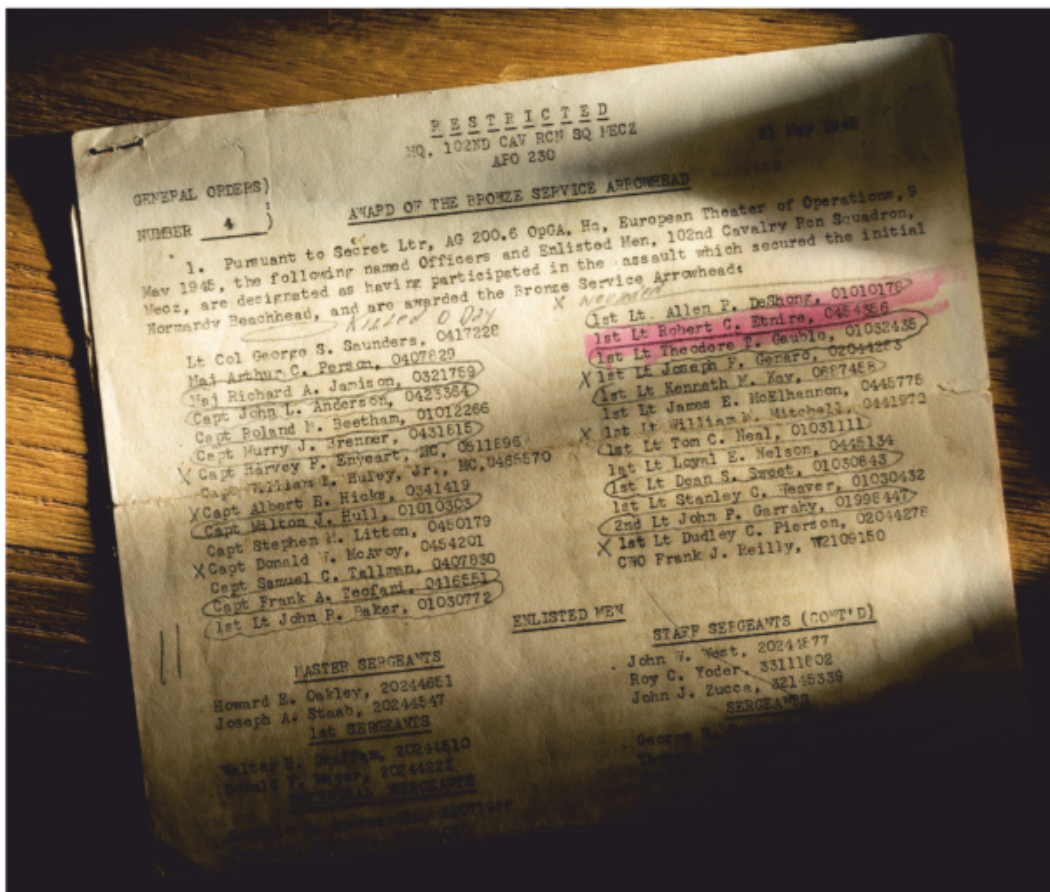
Firsthand accounts of people who lived through World War II matter, now more than ever. After three-quarters of a century, at a time when some would deny that certain wartime events even took place, these survivors have important lessons to teach us.

Sharing these stories gives all of us one more chance to thank the men and women of the Greatest Generation for their service and sacrifice.

Thank you for reading *National Geographic*. ▯

LEFT
Bob and Joan Etnire in 2012. In London during World War II, Bob attended a dance sponsored by the U.S. Army and met a charming British woman, Joan Walmsley. After they married in 1944, Bob brought his war bride back to the United States.

BELOW
The May 1945 list of Bob's squadron members at Normandy Beach, which he annotated and kept until the end of his life.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GENERAL ORDERS)
NUMBER 4)

AWARD OF THE BRONZE SERVICE ARROWHEAD

1. Pursuant to Secret Ltr, AG 200.6 OpGA, Hq, European Theater of Operations, 9 May 1945, the following named Officers and Enlisted Men, 102nd Cavalry Rcn Squadron, Mecz, are designated as having participated in the assault which secured the initial Normandy Beachhead, and are awarded the Bronze Service Arrowhead:

Killed 6 Jun
Lt Col George S. Saunders, 0417228
Maj Arthur C. Person, 0407829
Maj Richard A. Jamison, 0321769
Capt John L. Anderson, 0423584
Capt Roland M. Beetham, 01012266
Capt Murry J. Brenner, 0431615
X Capt Harvey P. Enyeart, MC, 0511896
Capt William T. Hurley, Jr., MC, 0465570
Capt [illegible], 0341419
X Capt Albert E. Hicks, 0101303
Capt Milton J. Hull, 0101303
Capt Stephen M. Litton, 0480179
X Capt Donald T. McAvoy, 0454201
Capt Samuel C. Tallman, 0407830
Capt Frank A. Teofani, 0416551
1st Lt John P. Baker, 01030772

X Wounded
1st Lt. Allen P. DeShong, 01010179
1st Lt Robert C. Etnire, 0454356
1st Lt Theodore E. Gauble, 01032435
X 1st Lt Joseph F. Genaro, 0207455
1st Lt Kenneth M. Kay, 0445775
1st Lt James E. McElhannon, 0445776
X 1st Lt William B. Mitchell, 0441972
1st Lt Tom C. Neal, 01031111
1st Lt Loyal E. Nelson, 0445134
1st Lt Dean S. Sweet, 01030843
1st Lt Stanley C. Weaver, 01030432
2nd Lt John F. Garraty, 01996447
X 1st Lt Dudley C. Pierson, 02044278
CWO Frank J. Reilly, W2109150

MASTER SERGEANTS
Howard E. Oakley, 20244651
Joseph A. Staab, 20244547

1st SERGEANTS

ENLISTED MEN

STAFF SERGEANTS (CONT'D)
John W. West, 20244477
Roy C. Yoder, 33111802
John J. Zucca, 32145339

PHOTOS: COURTESY ETNIRE FAMILY (TOP); REBECCA HALE, NGM STAFF

PROOF

NATIONAL GEOGRAPHIC

LOOKING AT THE EARTH FROM EVERY POSSIBLE ANGLE

PHOTOGRAPHS BY **GABRIELE GALIMBERTI**

Under lockdown, the nightlife hub where Rebecca Casale lives in Milan is empty. “I suffer a lot from loneliness,” she says. “Silence and empty spaces make everything surreal.”

FROM INSIDE THE QUARANTINE

As coronavirus ravaged Italy, a photographer in Milan resorted to taking portraits from afar.

Greta Tanini and Cristoforo Lippi normally live apart but found themselves together in the shuttered city. "We prefer to remain in isolation rather than taking risks or endangering the health of others," Tanini says.

G 4

Top: Luca Volta holds son Giovanni, four, and Michela Croci holds daughter Agata, six, in the kids' room; the parents say they try to keep busy with games. **Bottom:** Sadiq Marco Oladipupo, a rapper who goes by the name Roy, says he's using the time confined to his flat "trying to be creative, to work on new songs."

Top: Daniele Veronesi, an artist and set designer, and Anna Mostosi, who works in fashion, appreciate the free time at home but are growing increasingly worried about the health emergency. **Bottom:** Elizabeth and Paolo Lombardi—self-proclaimed hypochondriacs—quarantined before it was mandatory.

THE BACKSTORY

IN THE TIME OF CORONAVIRUS, A PHOTOGRAPHER GOES TO GREAT LENGTHS TO MAKE HIS PORTRAITS.

GABRIELE GALIMBERTI placed two stands of photographic lights in front of a window outside a dwelling. He retreated so the people inside could safely retrieve the lights. Shouting through the window, Galimberti directed the positioning of lights and people, then made his photos. This is quarantine portraiture.

"It's the strangest moment I've lived in 42 years of life," says Galimberti, an Italian photographer who was in Milan in late February when the lockdown went into effect. He and journalist Gea Scancarello spent the following weeks documenting how coronavirus changed life in the city.

In hopes of making portraits of some of Milan's inhabitants, they began calling their friends. "I immediately felt a sort of fear in their voices," Galimberti recalls. "Fear about the idea of going out and, a couple of times, clear fear about the idea of meeting me."

Just a week before, he had celebrated Scancarello's birthday in a crowded restaurant. Now the streets were empty, the bars were closed, and the slightest human contact could spark a meltdown. One day in a grocery store, Scancarello saw a man inadvertently brush against another, who screamed: "Don't touch me! You don't even have your mask! Go away!"

As the death toll rose, overwhelming hospitals, Milan's residents withdrew inside. "It feels like a war zone," says Galimberti. The pair persisted, persuading photo subjects with their careful methodology and strict distancing. Their aim, he says, was to show people around the world how the virus ravaged Italy so others could "act in advance" to help arrest its spread. –NINA STROCHLIC

Gabriele Galimberti stands on a six-foot ladder to photograph subjects from a safe distance.

ILLUMINATING THE MYSTERIES—AND WONDERS—ALL AROUND US EVERY DAY

NATIONAL GEOGRAPHIC | VOL. 237 NO. 6

How Satire Helps Science

CLIMATE CHANGE, GENE EDITING, AND VACCINE USE AREN'T LAUGHING MATTERS—BUT JOKING ABOUT THEM CAN CHANGE MINDS.

BY **PAUL R. BREWER** AND **JESSICA McKNIGHT**

IT MIGHT HAVE BEEN Stephen Colbert, John Oliver, Jimmy Kimmel, or any of the other sharp-tongued talk show hosts of late-night TV. In this instance, it was Samantha Bee, on her program *Full Frontal,* doing a stand-up routine about opposition to childhood vaccinations. "The anti-vax movement has been spreading faster than Legionnaires' disease at the Playboy Mansion," Bee declared, barely pausing for audience laughter. Claims that these vaccines are harmful rest on shoddy science, she said; the vaccines have been deemed safe by the World Health Organization and Centers for Disease Control and Prevention. "Who are you going to believe?" she asked. "Leading authorities on medical science, or 800 memes on your cousin's Facebook page?"

Joking about science can have serious effects, according to studies by communication scholars, us among them. Since 2013, Paul has conducted three studies of how satire can influence people's beliefs

about issues such as climate change, genetically modified foods, and vaccinations. We worked together on two of these studies, and with other colleagues Jessica recently tested whether late-night television can debunk misperceptions of vaccines (see story at right). Our and others' research has shown that if you want to interest people in science and shape their views on hot-button science issues, satirical humor can work better than a straitlaced approach.

MANY AMERICANS PAY LITTLE attention to science. Even people who regularly watch broadcast television news or cable news channels receive only scraps of science information in their media diet, because mainstream outlets devote so little airtime to the subject. On top of that, some Americans may regard science as intimidating and hard to understand, so they avoid the topic altogether.

Yet satirical humor can reach viewers who would never watch *NOVA* or read—well, *National Geographic*. Millions of people watch late-night television programs live, and videos of these shows get tens of millions of views on streaming services or YouTube. In 2016, when Paul, his colleague Barbara Ley, and the University of Delaware Center for Political Communication polled a nationally representative sample of Americans, nearly one in 10 said they learned about science from late-night television shows such as *The Late Show* and *Last Week Tonight*. This figure was even higher among young people.

Late-night television programs have mined laughs from science for decades. Even before Carl Sagan became known for the 1980 TV series *Cosmos,* he was a guest of comedian Johnny Carson, who spoofed the astronomer with an exaggerated pronunciation of "billion" (as in "100 billion galaxies"). Other scientists who've appeared on late-night programs include Neil deGrasse Tyson, Michio Kaku, and Jane Goodall.

It's not hard to see why the relationship between satire and science would be symbiotic. Late-night hosts may occasionally poke fun at scientists, portraying them as oddballs working on obscure projects. Much more often, however, the hosts promote a positive image of science. Take Colbert, whose NASA-themed humor led the space agency to name a zero-gravity treadmill after him; or Kimmel, whose show features science demonstrations with exploding pumpkins and flying Ping-Pong balls. By making science entertaining to audience members with little knowledge of the topic, late-night television could be a gateway to science engagement. But if these viewers do tune in to science topics, will their opinions change?

OUR FIRST EXPERIMENT in 2013 tested how watching a clip from *The Daily Show* or *The Colbert Report* influenced audience members' beliefs about climate change. Viewers who saw Jon Stewart say that global warming is real came away more certain that climate change is happening. Colbert's show had a similar effect, even though some viewers misinterpreted

Making a vaccine case with humor

Misconceptions about vaccine safety have contributed to new outbreaks of vaccine-preventable diseases, such as measles in 2014-2015 in California and in 2019 in Washington State. Last year I partnered with colleagues Emily Moyer-Gusé and Melissa Robinson to test how a segment of *The Daily Show* influenced parents' misperceptions about vaccines.

We randomly split study participants into two groups and gave one a joke-free version of the pro-vaccine segment. The other group got a funny version in which host Jon Stewart mixed humor with information about the seriousness of the measles virus. One of Stewart's jokes: "The United States has been hit with an outbreak of a terrible disease. I'm not going to tell you which one. I'm going to tell you this, it rhymes with Vin Diesels." And another, in which he riffs on a hip-hop hit: "Measles is off-the-chain contagious. It likes big lungs, and it cannot lie!" He also mocks parents who avoid vaccinating their children as "science-denying affluent California liberals."

Study results showed that viewing the funny version of the message lowered vaccine hesitancy among the participants, especially among those who previously had doubts about vaccine safety. For the audience members with the strongest doubts, the funny version reduced vaccine hesitancy by about 7 percent.

Traditional vaccine messages often spark a boomerang effect in which showing doubters pro-vaccine data only hardens their skepticism. Our findings suggest that humor offers a unique opportunity to address mistaken science beliefs without triggering that sort of backlash. **—JESSICA McKNIGHT**

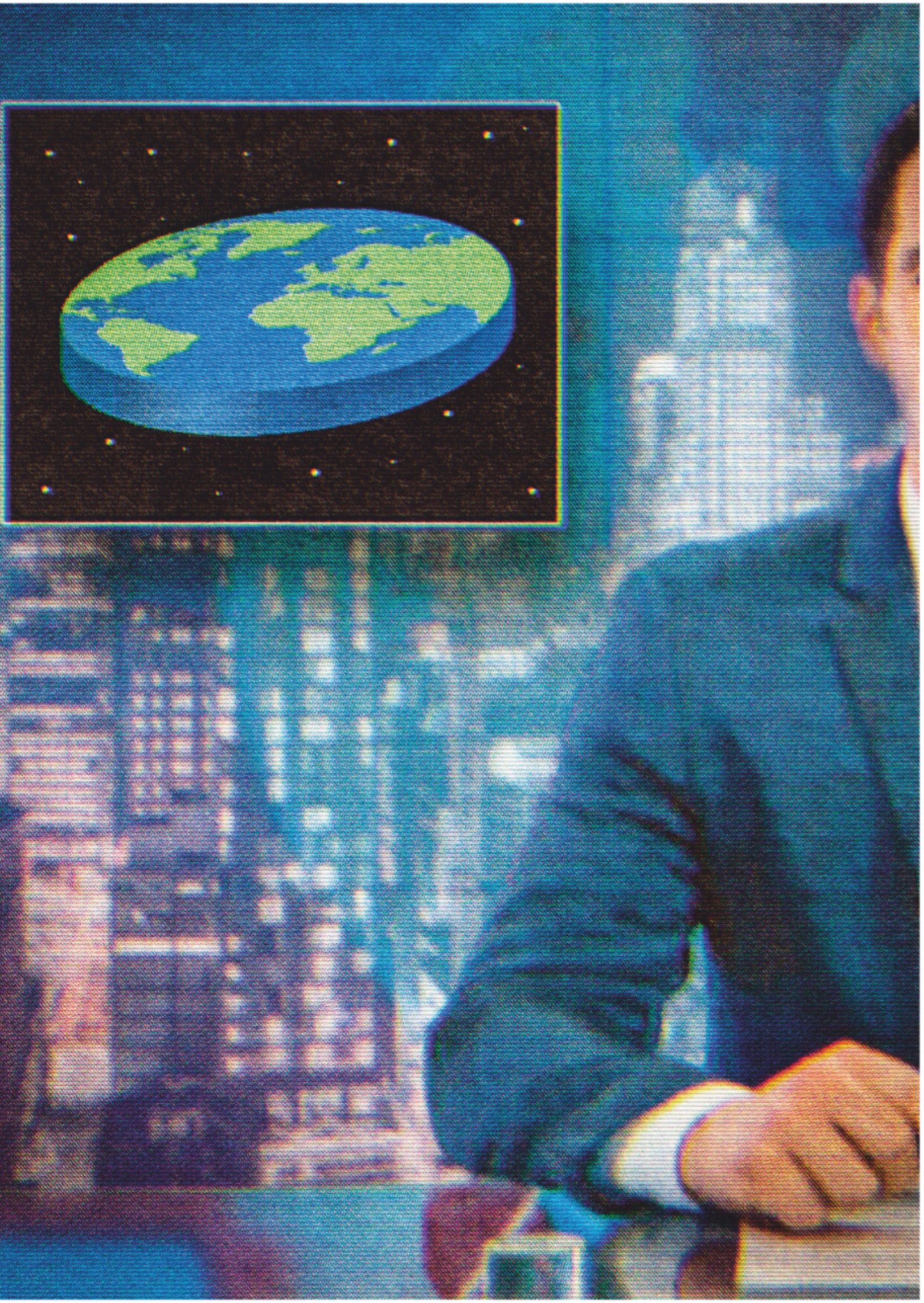


ILLUSTRATION: JAVIER JAÉN

his deadpan humor and mistook the host for a real climate change doubter.

In a 2015 follow-up study, we found that late-night humor can influence how viewers perceive climate science itself. This time, we tested the effects of a *Last Week Tonight* segment in which host John Oliver and guest Bill Nye hold a "statistically representative climate change debate" to illustrate the scientific consensus on the issue. Their "debate" shows Nye and 96 other scientists drowning out three global warming doubters. Watching this segment swayed study participants to see scientists as believing in human-caused climate change—which, in turn, bolstered participants' own certainty that global warming is happening. The effect was strongest among those least interested in science.

Other research has revealed the same sorts of effects. A study by Ashley Anderson and Amy Becker found that after watching a satirical video produced by *The Onion,* formerly apathetic viewers felt more certain that climate change is taking place and is a serious problem. In another study, Chris Skurka, Jeff Niederdeppe, and Robin Nabi showed that a segment from *Jimmy Kimmel Live!* led audience members to perceive greater risks from climate change.

Late-night hosts have also derided groups that, for example, cite a single discredited study to blame autism on vaccines, or push for teaching creationism in public schools despite the mountain of evidence for evolution. Kimmel has skewered fears about genetically modified foods—which most scientists say are safe to eat—by showing anti-GMO produce shoppers struggle to explain on camera what the acronym means. And on that *Full Frontal* episode mentioned earlier, a skit depicted fictional high school students mocking anti-vaxxers' claims ("Wow, you make vaccinations sound so cool; maybe it *is* bad to get diseases from the Middle Ages"). The 2016 poll that Paul conducted with Barbara Ley found that late-night viewers were more likely than nonviewers to agree with scientists on both GMOs and vaccines, even after accounting for many other factors that also shape science attitudes.

Late-night humor may be particularly effective at debunking scientific misconceptions because it avoids triggering the backlash that traditional science communication efforts can elicit. And late-night humor can spark science engagement as well. A national survey by researchers Lauren Feldman, Anthony Leiserowitz, and Edward Maibach found that watching satirical comedy programs went hand in hand with paying more attention to science stories. Furthermore, the researchers concluded that satirical shows had the biggest impact among the least educated viewers, thereby helping to narrow a gap in attention to science.

AT ITS BEST, LATE-NIGHT SATIRE ENCOURAGES VIEWERS NOT ONLY TO FOLLOW SCIENCE BUT ALSO TO THINK CRITICALLY ABOUT IT.

THOUGH LATE-NIGHT SATIRICAL humor can boost science interest and awareness, it has its limits. Science is complex, and conveying that complexity in a few minutes while cracking jokes can be a challenge.

At its best, late-night satire encourages viewers not only to follow science but also to think critically about it. An episode of *Last Week Tonight* made that point with a poke at how news outlets cover scientific studies. Host John Oliver warned against "thinking that science is à la carte and if you don't like one study, don't worry, another will be along soon." He ridiculed media coverage of science that oversimplifies and sensationalizes findings, misuses statistics, and cherry-picks results. And he parodied such presentations with his own brand of "TODD talks"—for Trends, Observations, and Dangerous Drivel.

The members of his audience may be laughing, but they seem to be learning as well. ▯

Paul R. Brewer is a professor of communication at the University of Delaware and co-editor in chief of the *International Journal of Public Opinion Research*. His research focuses on science communication and public opinion. **Jessica McKnight** is a doctoral candidate at Ohio State University. Her research centers on science and policy issues that often have important impacts on people's daily lives, such as public health and environmental sustainability.

Satire: The Classics

Throughout history, satire has been used to make social, cultural, and political points, and to influence public opinion.

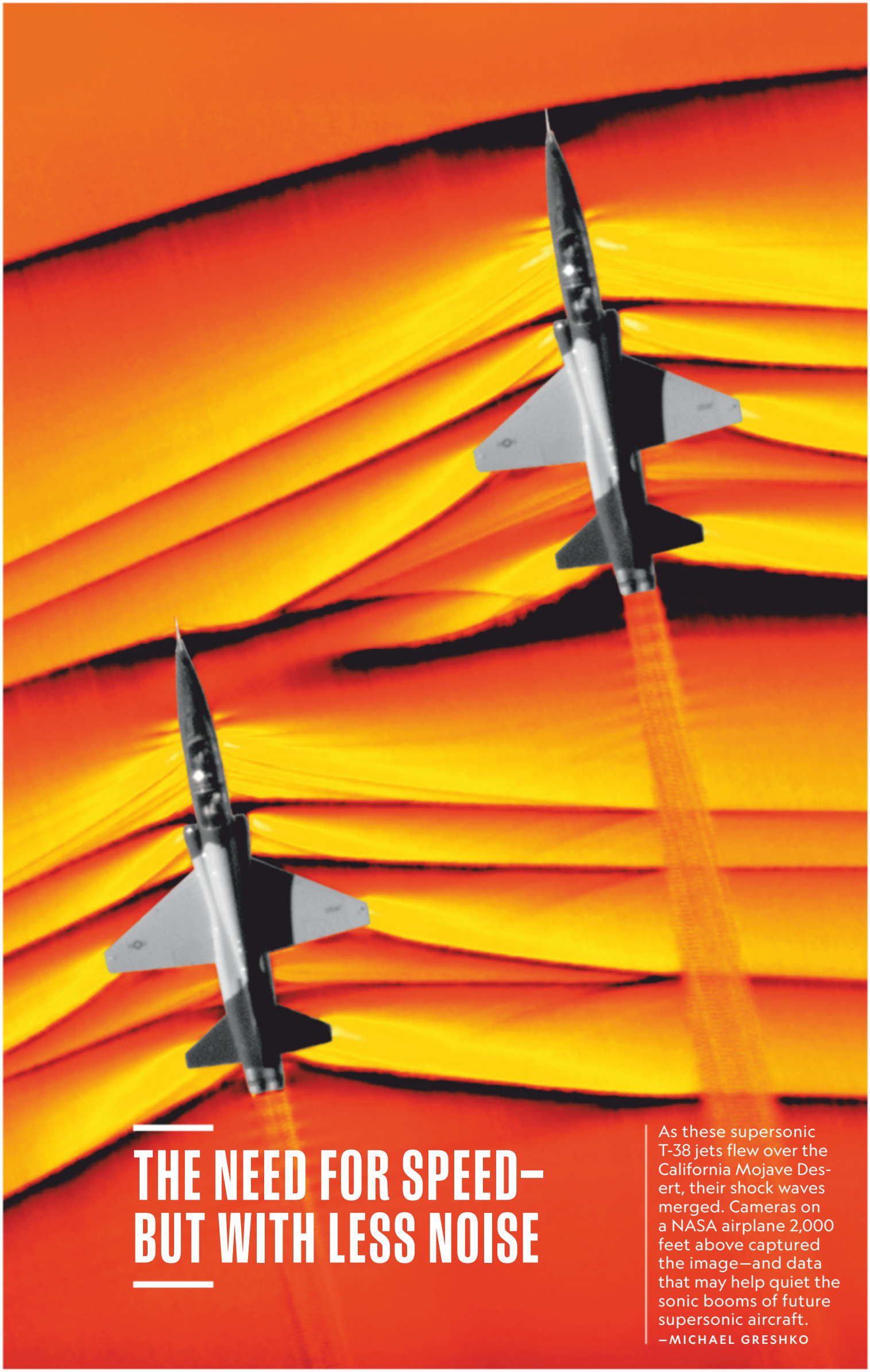
A Modest Proposal (1729) is Jonathan Swift's mock solution to Irish poverty.

Voltaire's ***Candide*** (1759) ridicules blind optimism in the face of inhumanity and disaster.

Animal Farm (1945) is George Orwell's veiled critique of Stalinism.

Dr. Strangelove Or: How I Learned to Stop Worrying and Love the Bomb is Stanley Kubrick 's 1964 dark comedy about nuclear brinkmanship (left).

PHOTO: COLUMBIA PICTURES/PHOTOFEST



THE NEED FOR SPEED—BUT WITH LESS NOISE

As these supersonic T-38 jets flew over the California Mojave Desert, their shock waves merged. Cameras on a NASA airplane 2,000 feet above captured the image—and data that may help quiet the sonic booms of future supersonic aircraft.

—MICHAEL GRESHKO

NASA USED FALSE-COLOR AND COMPOSITE TECHNIQUES TO MAKE THE SHOCK WAVES VISIBLE IN THIS 2018 IMAGE.

DISPATCHES
FROM THE FRONT LINES
OF SCIENCE
AND INNOVATION

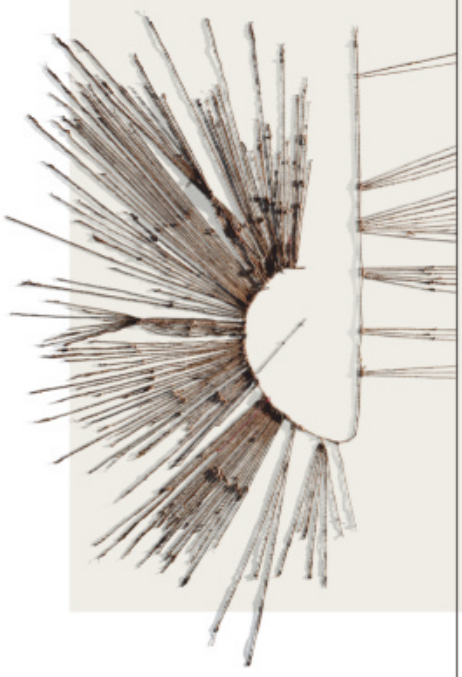
Magnetic heart passes test

At least 26 million people worldwide suffer heart failure; only about 5,500 a year get transplants. Artificial hearts so far have been heavy and complex—but a new "maglev heart" (right), powered by a single, magnetically levitating disk, could be a solution. Tested successfully in cows, the palm-size titanium device will soon begin human trials. –CD

ARTIFACTS

Honoring how Inca kept records

Because the Inca Empire lacked alphabetic writing, bureaucrats made notes with a quipu, a tool of colored strings and knots. Researchers studying 1,000 or so surviving quipus say they likely were used to record census data, taxes, and stories about Inca rulers. In January the Peruvian Ministry of Culture gave the quipu national heritage status, hailing it as an ingenious legacy of the indigenous culture.
—NINA STROCHLIC



ANIMAL BEHAVIOR

A NEW DIMENSION TO CUTTLEFISH'S HUNTING

SCIENTISTS STUDY THE CEPHALOPODS' 3D VISION (WHEN THE ANIMALS KEEP THE GLASSES ON)

COOL AS A ... CUTTLEFISH? The shades on this species are more than stylish: They revealed to scientists that cuttlefish, like humans, see with stereopsis, or two-eyed depth perception. When shown computer images of two shrimps—one red, one blue—placed slightly apart on a screen, the trained invertebrates moved close enough each time to sling their tentacles at the digital prey. This meant that the cuttlefish were calculating depth within seconds, their brains merging the red and blue shrimp images into a single 3D picture. Figuring out another animal's location in the water is vital for European cuttlefish to catch speedy prey, says University of Minnesota ecologist Trevor Wardill. "There's a lot more going on in that head than you might guess," he says. Still, the research hit snags. At first the cephalopods, like petulant tots, pulled off the glasses—until scientists plied them with treats: live shrimps. –CHRISTINE DELL'AMORE

PHOTOS (FROM TOP): PETER ADAMS; FEORD ET AL., 2020; ROBERT CLARK

INNOVATOR

GAUTAM SHAH

BY **THERESA MACHEMER** PHOTOGRAPH BY **REBECCA HALE**

He uses the power of gaming to promote wildlife conservation.

Gautam Shah had spent 20 years working in IT—and his whole life caring about nature. He saw advances in conservation that got mentioned only in science journals, "but the story lines within that data are amazing; they're fascinating," Shah says. "They're absolutely things that can engage an audience."

Eager to use his techie skills for wildlife conservation, Shah—a National Geographic explorer—founded a game company called Internet of Elephants in 2016. The Kenya-based start-up designs digital experiences to tell real conservation stories based on real data.

One example: Wildeverse, an augmented reality mobile app like Pokemon Go, launched in April 2020. In the game, players can "track" apes by collecting environmental samples such as fruit and scat. Rather than putting lots of high-tech tricks in a game, Shah says, the company prioritizes telling a compelling, true story through whatever technology is best suited to it.

Shah believes that gaming has a unique ability to connect audiences with wildlife in a deep, personal way that will generate concern and advocacy. His goal is for Internet of Elephants to reach more than 50 million people by 2027.

Ideally, he says, "we can create an entire industry where creating games and these type of digital experiences about wildlife conservation becomes as commonplace as creating a wildlife documentary." ▯

The Tale of a Lost Whale

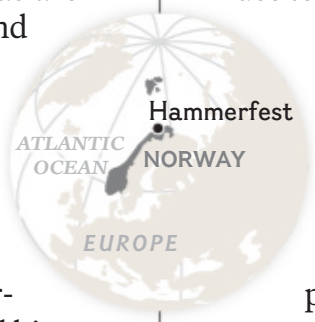
THE BELUGA WAS FRIENDLY.
IT WAS WELL TRAINED.
IT WORE A HARNESS.
WHERE DID IT COME FROM?

STORY AND PHOTOGRAPH BY
AUDUN RIKARDSEN

A FISHERMAN I KNOW named Joar Hesten called me late in April 2019. A beluga whale was swimming around his boat near the northern tip of Norway. It appeared to be wrapped in a tight harness, and Hesten didn't know what to do. Belugas are usually found in pods in areas with ice and glaciers—rarely alone along the Norwegian coast. As a marine biologist, I knew that the harness needed to be removed as soon as possible. I had no idea how puzzling it would turn out to be.

We contacted the Norwegian Directorate of Fisheries Sea Surveillance Service. When inspector Jørgen Ree Wiig and his crew rendezvoused with the fishing boat, the nearly 12-foot-long male eagerly engaged with them. He'd clearly been trained.

The mystery deepened when Hesten got into the water to remove the harness. Attached to the strap were a camera mount and clips with the words (in English) "Equipment St. Petersburg." The contraption didn't look like anything that a scientist would use to track whales.



NGM MAPS

The rescuers and I wondered whether he'd been trained by the Russian military. The media took that speculation further, dubbing him the "Russian spy whale." One outlet christened him Hvaldimir—a play on *hval,* the Norwegian word for "whale," and the first name of Russian president Vladimir Putin.

A week after his discovery, Hvaldimir followed a sailboat to Hammerfest harbor, about 25 miles from where he was first spotted. That's where I met him in early May and took this photograph. I had traveled to Hammerfest to determine his physical

condition. He was thin: He wasn't eating on his own and seemed unlikely to survive in the wild. Later the authorities decided to feed him; his meals became daily tourist attractions in Hammerfest.

Yet when I slipped into the water in my snorkel gear to examine Hvaldimir, I was most struck by his friendliness—and his loneliness. During our swim together, Hvaldimir pulled off one of my flippers, which sank into the deep. I shouted to him underwater, and he dived for it. A few minutes later, he returned with my flipper balanced on his snout and presented it to me. His former trainers, whoever they were, must have treated him well.

Training such a whale is expensive and time-consuming, yet no one claimed him. The Norwegian Police Security Service got on the case, and a German journalist used crowdsourcing to track the harness logo to an outdoor-equipment supplier in St. Petersburg. A trusted source told me that Hvaldimir had indeed escaped from a Russian Navy program in Murmansk. My source didn't reveal what the beluga had been trained to do.

In June Hvaldimir left Hammerfest, in much better shape than when he arrived. Since then he has traveled along the coast of northern Norway, apparently feeding himself. During the polar night, he swam in fjords near whale-watching and fishing vessels. Those waters are patrolled by hundreds of killer whales—potential predators.

Many people have opinions about what to do with Hvaldimir. Should the lone whale be placed in a dolphinarium, moved to a beluga habitat, or just left to himself? So far, he seems to be doing fine on his own. □

Audun Rikardsen is a nature photographer and a professor of freshwater and marine biology at UiT—the Arctic University of Norway. Previously he wrote about losing his camera to a polar bear.

NATIONAL GEOGRAPHIC | VOL. 237 NO. 6

JORDAN'S EPIC TREK

STRETCHING ABOUT 400 MILES, the Jordan Trail weaves through such storied sites as the ancient city of Petra (its monastery is shown here) and vast spaces of desert dune and rocky valley. Where Nabataeans and Romans once walked along trade routes, adventure travelers now roam.

WHAT YOU'LL SEE

Opened in 2017 and conceived as a north-to-south route, the trail begins in the village of Umm Qais and ends at the Red Sea city of Al Aqabah. Despite Jordan's arid climate, the landscape varies from olive tree–studded slopes in the north to water-lapped shores in the south. In between lie the otherworldly sandstone formations of Wadi Rum—often a movie stand-in for Mars—where pictographs from the Nabataean culture date back more than two millennia.

EXPLORE MORE

On the trail: Earth's lowest land point, the Dead Sea has a salt content so high that it inhibits macroscopic life—and allows swimmers to float effortlessly on the surface. Divers are drawn to colorful coral reefs in the waters off Al Aqabah.

Off the trail: The well-preserved Roman city of Jerash holds a massive hippodrome once used for chariot racing. In the Shaumari Wildlife Reserve, visitors can glimpse such rare species as the rhim gazelle and Arabian oryx.

HOW TO GET THERE

The trail's starting point, Umm Qais, is roughly two hours by bus from Amman, Jordan's capital city. Some travelers walk on their own, but the Jordan Trail Association supports weekend trips, four-day section itineraries, and an annual group expedition. Overnight accommodations can be arranged in village homes or in ecolodges staffed by local Bedouin.

‘DOTTED WITH THE RUINS OF EMPIRES ONCE GREAT, [JORDAN] IS THE LAST RESORT OF YESTERDAY IN THE WORLD OF TOMORROW.’

—Hussein bin Talal, former king of Jordan

GETTING THERE

BY THE NUMBERS

40

DAYS IT TYPICALLY TAKES TO HIKE THE ENTIRE TRAIL

52

VILLAGES ALONG THE WAY, MANY OFFERING HOMESTAYS

2,300

APPROXIMATE AGE IN YEARS OF THE CITY OF PETRA

BY **AARON GULLEY** PHOTOGRAPH BY **CATHERINE HYLAND**

NGM MAPS

JUNE

2

World War II ended 75 years ago this summer. Here are five ways to mark the moment.

BY **MARYELLEN KENNEDY DUCKETT**

1

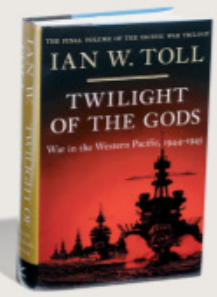
HISTORIC SITE

Island Outpost
Hundreds of bunkers, tunnels, and other remnants of Hitler's defensive Atlantic Wall dot the Channel Islands, located off the coast of Normandy, France. On Alderney, see the observation tower called the Odeon (above) and hike the Bibette Head Trail to explore some of the best-preserved German strongholds.

ARTIFACT

RECENTLY ADDED TO THE COLLECTION AT JERUSALEM'S YAD VASHEM, THE WORLD HOLOCAUST REMEMBRANCE CENTER, THIS COMPASS WAS USED BY JEWISH RESISTANCE LEADER SHLOMO BRANDT ON COVERT OPERATIONS IN WHAT IS NOW LITHUANIA.

3



NEW BOOK

Countdown to Peace
The last installment in military historian Ian W. Toll's Pacific War trilogy, *Twilight of the Gods* uses firsthand accounts to detail the ferocious battles and high-stakes decisions of the war's final year.

4

WORKS OF ART

WHILE INTERNED during the war, artist George Hoshida recorded his surroundings in drawings and watercolors. View a display online and in rotating exhibitions at the Japanese American National Museum in Los Angeles.

5

RESTORED AIRCRAFT

THE NONPROFIT COLLINGS FOUNDATION MAINTAINS HISTORIC PLANES, SUCH AS THE WWII-ERA LOCKHEED P-38 LIGHTNING, THAT TOUR MUSEUMS AND AIR SHOWS AROUND THE UNITED STATES.

PHOTOS: ALDERNEYMAN/ALAMY STOCK PHOTO (TOWER); YAD VASHEM ARTIFACTS COLLECTION, COURTESY IKA BRANDT, REUT, ISRAEL (COMPASS); JAPANESE AMERICAN NATIONAL MUSEUM (GIFT OF JUNE HOSHIDA HONMA, SANDRA HOSHIDA, AND CAROLE HOSHIDA KANADA, 97.106.1FO); SCOTT SLOCUM, AERO MEDIA GROUP (PLANE)

ON THE MENU IN PERU: SUPER POTATOES

PHOTOGRAPH BY **ALEC JACOBSON**

SINCE AT LEAST 5000 B.C., inhabitants of what's now Peru have been feasting on spuds. It makes sense: More than 4,000 varieties grow here. But the diversity and cultural value of the crop are under threat from industrialized agriculture. Today inventive chefs such as Virgilio Martínez are boosting the status of the potato and other traditional Andean foods into cuisine often dubbed Novoandina.

At Mil, Martínez's restaurant in the Sacred Valley, travelers can help harvest the very potatoes that will end up on their plates as part of an eight-course, Andean-focused menu. The myriad types found at Mil (some shown here) are due in part to Peru's latest potato pioneer, Manuel Choqque Bravo. He has created what he calls Manuel's super potatoes—high in antioxidants and ablaze with pink, blue, and purple hues. Bravo proves tubers are delicious not only as food but also as drink, with innovations that include Miskioca, a fermented tipple made from the colorful potato-like oca.

Another game changer, Lima-based chef Palmiro Ocampo, promotes zero-waste cooking and sustainable food with dishes like potato-peel chicken nuggets. Drawing from the past to transform modern fare, these chefs are passing the potatoes, and helping to make Peru one of the world's top dining destinations. –REBECCA WOLFF

On the west coast of the Danish island Bornholm, the 49-foot-tall Krogeduren is a freestanding rock tower that attracts climbers.

COASTAL CONNECTION

DENMARK'S STORIED TIES TO ITS SHORES MAY BE THE COUNTRY'S SECRET TO WELLNESS.

BY **HELEN RUSSELL**

IN DENMARK you're never more than 30 miles from the sea. Aside from Jutland's boundary with Germany, Denmark is entirely surrounded by water, with a total of 5,437 miles of coastline, or *kystland*.

"This made it perfect for the Viking society, in which sailing was the most important way to get around," says Rikke Johansen, curator at the Viking Ship Museum, in Roskilde. "Land divided people; water connected them."

Fishing was a necessity for survival long before Denmark, which is made up of 406 islands, became an agricultural nation, but today, Johansen says, water means leisure for most Danes: "We take it for granted; it's a way of life. For many of us, looking out at water every day is key."

The whole of Denmark is lowland, formed by Ice Age glaciers and glacial streams. With the highest point just 558 feet above sea level, the country is especially susceptible to flooding and storms. Sea levels are expected to rise three feet by 2100, and archaeologists are worried that historical sites on the coast will disappear altogether.

In 2019 the 120-year-old Rubjerg Knude lighthouse, originally built 656 feet from the sea, had to be wheeled back, as coastal erosion had shrunk that distance to just 19 feet. To protect low-lying land,

PHOTO: MATHIAS SVOLD AND ULRIK HASEMANN

CANON VIDEO SQUARE

The Canon Video Square website showcases Canon's businesses, products, services, technologies and social activities. More than 60 videos are available in 5 categories: About Canon, Canon Technologies, Environmental Activities, Protecting Cultural Assets and For Kids. The video entitled "Canon Visual Overview" introduces the Canon of today, highlighting such aspects as the company's new businesses, research and development, manufacturing, sales and CSR activities.

LEARN MORE AT
GLOBAL.CANON/EN/V-SQUARE/#ABOUTCANON

Canon

dikes have been built along 1,118 miles of coastline, and most are covered by grass to encourage wildlife. To defend exposed stretches of coast from accelerated erosion, sand is brought in from designated areas offshore to nourish shorefaces, beaches, and dunes, without which some parts of the west coast would retreat by 26 feet a year.

On the windy west coast of Jutland, Klitmøller is known as Cold Hawaii because of its seven-foot waves and surf culture. "There's a strong history of fear around the water, and respect for it too," says local Casper Steinfath, a world champion stand-up paddle surfer. He tells me about the tradition of swimming with a rope that's tied around the waist and tethered to a pier or other sturdy object, to avoid being pulled under. "We have a saying on the west coast that we're 'born against the wind.' But it makes you stronger."

At the northern tip of Jutland, the Baltic meets the North Sea at Skagen, where you can stand in the shallows to feel the bodies of waters collide. Formerly the largest fishing community in Denmark, Skagen is now famed for migrating sand dunes and a unique quality of light that has inspired everyone from the 19th-century Skagen painters to contemporary artists such as Niels Poplens. "In Skagen even the shadows are bright," says Poplens.

Denmark's east coast, where I live, is more sheltered. Protected inlets and fjords lend themselves to tamer pastimes, such as stand-up paddleboarding. Soft, sandy beaches attract recreation au naturel; there are whole stretches of sand reserved for nudists. After a recent dip off a pier, I mounted a stepladder to be greeted by an octogenarian as bare as the day he was born.

In Bornholm, off the coast of Copenhagen, you can eat Michelin-starred cuisine and lounge on sand so fine, it was used in hourglasses.

Photogenic Ærø, a tiny isle south of the central Danish island of Fyn, has become known as Denmark's wedding island.

In summer, when it can stay light past 11 p.m., many Danes fit in a second shift of leisure after work to sail, fish, kayak, or windsurf. "You never get bored," says boatbuilder Søren Nielsen, from Roskilde. "You can leave your phone, your 'busyness,' behind and just get out there to feel close to nature."

As Steinfath says, "The coastline is my happy place." It's little wonder that Denmark is regularly reported as one of the happiest countries in the world, including by *Blue Zones* author Dan Buettner.

With 1,300 near-pristine beaches and a population of just 5.8 million, it's not unusual to have a beach to yourself in Denmark. Many towns provide sleeping shelters and stores of chopped wood to encourage campers, and you can dine for free from plentiful mussel beds much of the year. All you need is a cooking pan and some Viking spirit.

"There's definitely a Nordic energy here," says Steinfath, "and as a Viking, you develop resilience. The coastline is a place where ocean and Earth are locked in an eternal and relentless battle. These wild forces of nature both inspire and humble me. They make me feel alive." ▯

Helen Russell is the author of *The Year of Living Danishly* and, most recently, *The Atlas of Happiness*.

Shore up (clockwise from top left): Friends splash and climb at Rudkøbing beach; coastal erosion endangers a now abandoned house; Copenhagen harbor welcomes a swimmer; Denmark's largest sandbox is Råbjerg Mile; friends stand on Sanctuary Rocks on Bornholm.

PHOTOS: MATHIAS SVOLD AND ULRIK HASEMANN. NGM MAPS

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Hiroshima Stories..... P. 86
Emperor Penguins..... P. 94
Women in Politics.....P. 108
Skateboarding..... P. 132

FEATURES

94

‘BEFORE THE SEA ICE MELTS, THE EMPEROR PENGUIN CHICKS MUST SWAP THEIR GRAY DOWN FOR WATERPROOF, ADULT FEATHERS; OTHERWISE, THEY’LL DROWN.’

PHOTO: STEFAN CHRISTMANN

R.R. "RUSSELL" CLARK, U.S. NAVY (SEE PAGE 64)

GALINA SIDORENKO, LENINGRAD SURVIVOR

HARUO YAMA

JOHN "JACK" THURMAN, U.S. MARINE CORPS

CLARA HUNTE

MAXIMILIAN LERNER, COUNTER INTELLIGENCE CORPS

AZUMA OHYA

DA, JAPANESE ARMY

MIKHAIL MOROZ, SOVIET FORCES

R DOUTLY, AMERICAN "ROSIE THE RIVETER"

KISAKO MOTOKI, TOKYO AIR RAID SURVIVOR

, JAPANESE ARMY

NINA DANILKOVICH, BELARUSIAN RESISTANCE

BORIS SMIRNOV, SOVIET MEDIC (SEE PAGE 65)

THE LAST VOICES OF WORLD WAR II

Some were **HEROES.** Some were **VICTIMS.** Others fought for the **FASCISTS** who sought to **DOMINATE** the **PLANET.** As their **GENERATION FADES** 75 years after the **FIGHTING STOPPED,** their remembrances are as **POIGNANT** as ever.

Introduction by
LYNNE OLSON

Photographs by
ROBERT CLARK

Racing to claim the prize that was Berlin, Soviet soldiers rush through the streets of the doomed German capital in April 1945. By then the city was in ruins from Allied bombing, and Hitler's Third Reich was crumbling. German forces surrendered on May 7; the following day was declared Victory in Europe (or V-E) Day.

DPA PICTURE ALLIANCE/GETTY IMAGES

WOLFGANG BROCKMANN

German veteran

'A young Russian soldier came out of the bushes ... **WITHOUT WEAPONS**, hands up, already bandaged, injured. He must have been completely lost. I would have said, **GO BACK! GET OUT OF HERE!** But an older soldier immediately pulled out his gun and shot him. That was against all my ideas of surrender ... But these are the horrors of war, which **TURNS HUMANS INTO MONSTERS.'**

Brockmann, now 93, was 12 years old in 1939, when Germany invaded Poland and ignited World War II. Hitler was his idol, and he itched to get in the fight. When he did, late in the war, he saw atrocities that were "against all the morals I felt as a German soldier." He ended the war in Soviet captivity—"the worst-case scenario," he says.

771
1032

Equipment and supplies litter the island of Iwo Jima, scene of one of the bloodiest battles of the war in the Pacific. After five days of fierce fighting, U.S. marines raised the American flag atop Mount Suribachi (background). But the fighting would rage for another three weeks, driving even battle-hardened warriors to their limit. Said one veteran: "I came across marines sitting on the ground, hands to their faces, sobbing their hearts out."

UNIVERSAL HISTORY ARCHIVE/ GETTY IMAGES

NOBUO NISHIZAKI

Japanese veteran

‘We were sent to **DIE FOR THE EMPEROR AND IMPERIAL NATION,** and everyone acted like we believed in it. But when the soldiers were dying, the young ones **CALLED OUT TO THEIR MOTHERS** and older ones called out their **CHILDREN’S NAMES.** I never heard anyone calling the emperor and nation.’

Leaving home for the navy in 1942, Nishizaki, then 15, was given an order by his mother: “You must survive and come back,” she said. He clung tightly to her words, even as the winds of war swept him across the Pacific, from one battle to the next, and finally to a suicide mission at Okinawa. Despite long odds, he lived—and honored his mother’s demand.

A fallen Soviet soldier still grips a hand grenade while another takes aim at German invaders during the Battle of Stalingrad. The battle—one of the largest and longest in history—went on for 200 days, reducing the city (since renamed Volgograd) to rubble. Both sides suffered staggering losses, but Soviet forces ultimately prevailed, destroying the entire German Sixth Army and turning the tide of war in Europe.

ROGER-VIOLLET/GETTY IMAGES

1990
-
2015

VERA NIKITINA

Leningrad blockade survivor

'I don't want to remember any of it, even to speak of it. **IT'S ALL SO HARD**. I don't want that anyone would ever have to **SUFFER** such a thing again. When I talk of my childhood, I get upset. **I START TO CRY**. I don't want to cry anymore; I want to live the **REST OF MY LIFE IN PEACE** and see only the good in life. I don't want to see **ANYTHING TERRIBLE ANYMORE**. I'm sorry.'

Nikitina, 87, was a child when the 900-day Nazi blockade of Leningrad began. Having already lost her mother, and with her father off at war, she was quickly evacuated from the besieged city. Nearly all of her relatives who couldn't escape the Nazi stranglehold died from the hunger, cold, and bombings that claimed some 800,000 civilian lives.

SEVENTY-FIVE YEARS AGO, the most far-flung, destructive, and lethal war in history approached its end. World War II lived up to its name: It was a true global conflict that pitted the Allied powers—the United States, the Soviet Union, Britain, China, and their smaller allies—against Germany, Japan, Italy, and a few other Axis nations. Some 70 million men and women served in the armed forces, taking part in the greatest military mobilization in history. Civilians, however, did most of the suffering and dying. Of the estimated 66 million people who perished, nearly 70 percent—some 46 million—were civilians, including six million Jews murdered during the Holocaust. Tens of millions more were uprooted from their homes and countries, many of them living in displaced persons camps for years to come. ¶ The war's aftereffects were as staggering as its scale. It laid the groundwork for the world we've known for more than seven decades, from the dawn of the nuclear age to the creation of Israel to the emergence of the United States and Soviet Union as the world's dueling superpowers. It also sparked the formation of international alliances such as the United Nations and NATO, all designed to prevent such a cataclysm from happening again. ¶ Yet, with the passage of time, public awareness of the war and its almost unfathomable consequences has faded, becoming as dim as the sepia tones of an old photograph. At the same time, firsthand witnesses are dwindling in number. According to U.S. government statistics, fewer than 400,000 of the 16 million Americans who served in the war—2.5 percent—were still alive in 2019. ¶ But thanks to the willingness of some of the last survivors to share their stories, we've been given a valuable gift: a chance to bring the war into sharp

focus again by viewing it through their eyes. With no access to the internet or other forms of today's instant communications, most of these men and women knew little of the world beyond their communities before the war. By wrenching them out of their familiar settings, it exposed them to an overwhelming array of new experiences and tested them in previously unimaginable ways. Many found the challenges exhilarating.

That was true for 18-year-old Betty Webb (page 60), who was recruited to join Britain's top secret code-breaking operation at Bletchley Park. Webb was one of countless women whose work was crucial to their countries' war efforts and who, in the process, found a sense of self-worth and independence they'd never known before.

Harry T. Stewart, Jr. (page 66), the 20-year-old grandson of a man born into slavery, proved himself as well. A New Yorker who had never driven a car before the war, Stewart became a fighter pilot in the famed all-black unit known as the Tuskegee Airmen, flying 43 combat missions and winning a Distinguished Flying Cross.

These triumphs are inspiring and should be celebrated. Yet what dominates the survivors' stories are the tragedies experienced by so many of them, Allied and Axis alike. Their accounts are testament to the sheer hell of World War II—the brutality, suffering, and terror experienced, and inflicted, by both sides. Particularly haunting is the testimony of Victor Gregg (page 64), a British soldier captured by the Germans. His prison was destroyed in the Allied fire bombing of Dresden in February 1945. Gregg, who witnessed the fiery deaths of German civilians there—some 25,000 perished—was left with an abiding sense of guilt and shame. "These were women and children," he said. "I couldn't believe it. We were supposed to be the good guys." His story, like the others, should remain indelibly imprinted on our minds.

Lynne Olson is the author of *Last Hope Island: Britain, Occupied Europe, and the Brotherhood That Helped Turn the Tide of War.* This is her first story for *National Geographic*.

An American soldier comes ashore on Omaha Beach during the Allied invasion of German-occupied France on D-Day, June 6, 1944. With some 7,000 ships carrying nearly 160,000 troops, the largest seaborne invasion in history set the stage for the liberation of Europe.

ROBERT CAPA, INTERNATIONAL CENTER OF PHOTOGRAPHY/ MAGNUM PHOTOS

More at Nat Geo online
Veterans and survivors from around the world share first-person accounts of the war at *natgeo.com/ww2*.

How this story came to be
Special thanks to photographer Robert Clark and his father, U.S. Navy veteran R.R. "Russell" Clark (pages 42 and 64), who inspired this story, and to the many individuals who welcomed Robert and our writers into their homes and shared their memories.

‘I wanted to do something MORE FOR THE WAR EFFORT than bake sausage rolls.’

“It was in that room there that I signed the Official Secrets Act.” Betty Webb, 97, points with her walking stick to a ground floor room in the baronial mansion at Bletchley Park, Britain’s legendary top secret code-breaking facility during World War II. Through the bay window, a massive desk is visible. “There was a senior intelligence officer seated behind that desk,” she says, “and I remember he had a handgun lying casually beside him, right where that coffee cup is now. I was told to sign and made to understand in no uncertain terms that I could never discuss anything about my work here with anyone. I signed. It was a sobering moment. I was 18 years old at the time.”

That was in 1941. Britain was at war. German troops had already overrun much of Europe.

Webb had been taking a home economics course but joined the Auxiliary Territorial Service—the women’s army—because, as she put it, “I wanted to do something more for the war effort than bake sausage rolls.” Webb was bilingual—she’d grown up with a German au pair and had been an exchange student in Germany—so she was ordered to report to Bletchley, an hour or so north of London. “It was so secret I had no idea what it was—nobody did!—let alone what I was getting into.”

Initially Webb was put to work cataloging the thousands of encrypted German radio messages that British listening posts were intercepting each day. But as the war progressed, she moved to a more creative role: paraphrasing priceless nuggets of intelligence gleaned by the code breakers so no one would suspect it had been obtained by broken codes.

“We had to make it sound as though it was information we’d picked up from spies or stolen documents or aerial reconnaissance,” she said. “The fact that we’d broken German and Japanese military codes was a closely guarded secret, known only to a very few people.”

Webb enjoyed the work. “I liked the deviousness of it,” she says with a smile. She also worked on intercepted Japanese messages and was so good at paraphrasing their contents that in June 1945, after the war in Europe ended, she was sent to Washington to help the American war effort in the Pacific. “I flew over in a flying boat,” she recalls. “It was the first time I’d ever been up in a plane. I sent my parents a postcard from Washington. I’m sure they must have wondered what I was doing, but of course they never asked, and anyway I could never tell them.”

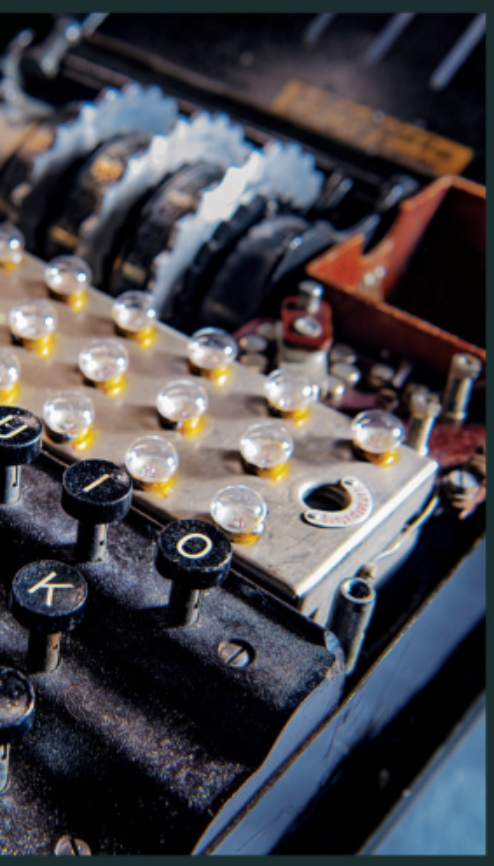
Decades would pass before any of the people at Bletchley were allowed to speak of their work during the war. “Both of my parents had died by then, so they never knew,” she says. “All the secrecy made it tough to get a job after the war, especially for the men, since you couldn’t tell employers anything about your war years other than that you’d worked at some place called Bletchley Park.”

Webb eventually found work at a school whose headmaster had been at Bletchley. “I never knew him at the time,” she says, “but when he saw on my application that I’d been at Bletchley too, no words needed to be said, no awkward questions asked. I got the job.” *—Roff Smith*

BETTY WEBB

British intelligence

Webb, 97, was 18 when she started work at Bletchley Park, Britain's top secret code-breaking center. German leaders believed messages encrypted by their Enigma machines—this model (below) could generate 103 *sextillion* combinations—were all but unbreakable. Bletchley personnel proved them wrong.



Decades would pass before those who worked at Bletchley Park were allowed to speak about what they did during the war.

ENIGMA PHOTOGRAPHED AT BLETCHLEY PARK TRUST

YEVSEI RUDINSKY

Soviet navigator

THE WAR CAME for Yevsei Rudinsky, a student and gymnast, when he was sent to a recruitment station and was told the country needed 100,000 pilots. "I didn't dream of aviation, but I really liked to study," says Rudinsky, 98. Drawn to charts and astronomy, he trained to become a navigator in Russia's far north, where polar pilots taught their inexperienced charges to orient in treacherous weather without reliable maps. His baptism into combat came in the skies above Kursk, scene of the war's biggest tank battle. "I flew a dive bomber, Petlyakov PE-2. We lovingly called it Peshka," meaning a chess pawn. He recalls fear only after landing. "When you see how many holes you have in your plane, or how the Messerschmitts attacked you, then you start to feel." He adds: "If you feel nothing, you're not human. And in the end we're all human."

—Eve Conant

The fighting ended 75 years ago, but Maria Rokhlina, now 95, still feels the war in her hands, in every finger. Born in Ukraine, she dreamed of becoming a pilot. But by 1941, when she was 16, the Nazis were advancing deep into her homeland. "I stepped from my school desk into the war," she says. She became a combat medic and served with the Soviet forces for four years.

One day, as she was helping ferry a wounded soldier across the roiling Dnieper River, her oar broke, so she paddled through the bone-chilling water with her bare hands. The pain in her fingers is still so severe that she takes injections in each joint for relief.

In 1942 Rokhlina became trapped in the besieged city of Stalingrad. The battle raged for more than six months, reducing the city to ruins and decimating its population. Winter temperatures regularly plunged below zero degrees Fahrenheit. Rokhlina holed up with Soviet troops in a tractor factory, but there wasn't a scrap of paper or wood to burn. "We had to warm each other with our bodies," she says. "We took an oath there—never to forget Stalingrad, never to forget those who stood hugging each other" in what she calls "warming circles."

Then there are the memories Rokhlina has tried to forget but can't: the heat of a dying soldier's intestines as she tried to push them back into his abdomen. Or a fellow medic who was raped and killed by the Germans, her breasts sliced off. "I cannot forgive them for what they did and what I saw."

But like the heating circles, the horrors forged bonds. A Soviet soldier, on first sight of her, promised to propose if they survived the war. They were married for 48 years.

—Eve Conant

‘We did not bury dead bodies in the winter in Stalingrad. **CORPSES WERE PILED UP.** There was no place to bury them.’

MARIA ROKHLINA

Soviet combat medic

VICTOR GREGG

British rifleman

AN OFFER OF A BUN and a cup of hot tea sounded awfully good to Victor Gregg on that raw London day in October 1937—enticing enough to follow a recruiter back to his office and sign up for the British Army. "It was my 18th birthday," recalls Gregg, now 100. "And you know, as far as I recall, I never did get that cup of tea."

Instead he got a harrowing front-row seat to World War II, from start to finish. After qualifying as a marksman, Gregg was posted briefly to India and was serving in Palestine when the war broke out in September 1939. He spent the next three years in the North African desert, on covert missions behind enemy lines. Later he became a paratrooper and took part in the invasion of Italy. In September 1944 he was dropped into the Battle of Arnhem—a failed Allied attempt to secure a bridge over the Rhine River.

"They told us it would be a walkover," he recalls. "Instead we ran into some Panzer divisions nobody seemed to have reckoned on." The fighting was brutal, hand to hand, and the British paratroopers were overrun. Gregg was captured and sent to a labor camp near Dresden, Germany.

That winter he made two unsuccessful escape attempts and as punishment was sent to work in a soap factory. He and another POW sabotaged the factory, causing it to burn to the ground—an act for which they were sentenced to death. "They transferred us to a prison in Dresden and told us we were to be shot the next morning," Gregg says.

Fate intervened. That night British and American planes began raining firebombs on Dresden. The prison took a direct hit, and Gregg escaped through a broken wall. He says the horrors he saw over the next few days would haunt him for the rest of his life and fill him with guilt and shame. "Until then my war had been soldiers fighting other soldiers, but these were women and children, civilians," he says. "I couldn't believe it. We were supposed to be the good guys."

Gregg escaped from Dresden in the aftermath of the bombing and made his way east to join the advancing Soviet forces. He was with them in Leipzig the day Germany surrendered.

After six years of living on the edge, he found it impossible to settle into postwar civilian life. He says he sought out risk and danger, whether it was riding motorcycles, doing clandestine work for the British intelligence agency MI6, or involving himself with underground pro-democracy movements behind the Iron Curtain.

Memories of Dresden proved to be a particularly heavy burden. But recently Gregg was invited there to give a talk about his experiences. In the audience was a woman in her early 80s who, as a young girl, had survived the Dresden bombing but lost a leg. As they spoke after his lecture, Gregg says, he found the inner peace he'd been seeking for decades. "Somehow, at last, I felt forgiven." *—Roff Smith*

R.R. 'RUSSELL' CLARK

U.S. sailor

WHEN A FOOTBALL injury left Russell Clark with a hernia, he knew he'd be disqualified for military service. But 18-year-old Clark, born and raised on a Kansas farm, was determined to join his two brothers at war. He paid for the operation to correct his condition, then enlisted.

By early 1945 Clark was somewhere in the North Atlantic, working in the engine room of the destroyer escort U.S.S. *Farquhar*. "It was hot and steamy down there—100 degrees," recalls Clark, 95.

Despite the long, hot hours belowdecks, Clark considered himself lucky. "The poor guys who had to be up on the deck in the North Atlantic, they were mighty cold," he says. His one brush with the enemy came the morning after Germany's surrender. A Nazi sub that apparently hadn't gotten the memo bore down on the *Farquhar*.

"We had no choice," he says. "We made a torpedo run on them."

An oil slick was all that remained. *—Bill Newcott*

WILHELM SIMONSOHN

German pilot

GUIDING TANKS and artillery to their targets from a spotter plane, Wilhelm Simonsohn saw the German invasion of Poland in 1939 from high above the fighting. From his perch, the first days of the war seemed like a great adventure. All that changed when Simonsohn entered Warsaw. The Polish capital was in ruins, shattered by German bombs. Thousands of people, mostly civilians, were killed in the attack. Simonsohn, now 100, says he still remembers the smell of rotting bodies trapped under the rubble. "It made such an impression on me that I said to myself, 'I'll never drop a bomb on a human being.' "

Instead he trained as a fighter pilot and flew dozens of night missions, scrambling to intercept British bombers. "I flew with the idea that I'd prevent the English from setting our cities on fire," he says. "I was 22, and naive." By the spring of 1944, having watched German cities go up in flames, Simonsohn knew the war was lost. "I realized I just needed to survive," he says. News of Germany's surrender came as a tremendous relief. "May 8, 1945, was a second birthday for me. It meant an end to all the killing, all the fear," he says. "All those burning cities made me a pacifist. And I've only become more of one as the years have gone by."

—Andrew Curry

SHIZUYO TAKEUCHI

Japanese survivor

THERE'S NO escaping her memories of February 25, 1945—the day American B-29s firebombed Tokyo. Then 13, Shizuyo Takeuchi returned to find cinders where her home had been. Only an iron rice pot survived. The forbidden English dictionary, a gift from her father, was ash. She held a single page, which the wind soon swept away. A second firebombing on March 10 left her with images of running through a maelstrom of debris and smoke, and passing charred bodies—one, a mother who had tried to shield her infant beneath her.

"I felt scared because I lost my emotions for a time," Takeuchi recalls. Now 89, married, and with a son and daughter, she works as a storyteller at a center dedicated to bearing witness to the horrors of war. *—Ted Gup*

BORIS SMIRNOV

Soviet medic

"WE WERE FULL of Soviet patriotism," says Boris Smirnov, 93, who saw many of his comrades die during the conflict the Soviets named the Great Patriotic War. On one occasion, Smirnov's platoon was building a bridge over the Neman River when their commander was struck by a bullet, possibly from an enemy sniper.

"As I tried to help him, there was another soldier next to me," Smirnov recalls. "He said, 'Hey doctor, you help him, and I'll cover you.' " As the medic bandaged the fallen officer, a shot rang out from the opposite bank, instantly killing the soldier standing watch over him. "He fell quietly," says Smirnov, still grieved by his protector's death.

More traumatic was the day in October 1944 when Smirnov's platoon was surrounded and callously gunned down. "I saw the laughing German soldiers who were sitting some 50 to 60 meters from us," Smirnov says. "We were rushing at them, screaming; they were laughing and waving their hats. My friends were falling down all around me."

There is a document from Russian archives that Smirnov holds dear. It's a list of his fallen comrades. *—Eve Conant*

HARRY T. STEWART, JR.

U.S. airman

A handcrafted model of a P-51 Mustang holds powerful memories for Stewart, who flew 43 combat missions in just such an airplane. The grandson of a man born into slavery in Alabama, Stewart (below, at left) shot down three enemy aircraft while escorting American bombers and was awarded the Distinguished Flying Cross.

By 1945 more than 1.2 million African Americans were serving in uniform in Europe, the Pacific, and on the home front.

‘I just want them to be remembered as good citizens’ WHO HELPED PROTECT THEIR COUNTRY ‘even in the face of discrimination.’

Nearly a thousand African-American pilots who served in World War II learned to fly at Tuskegee, Alabama, the only U.S. military airfield that trained black cadets. Just 10 of the famed Tuskegee Airmen remain today, and retired Lt. Col. Harry T. Stewart, Jr., who turned 95 last Independence Day, is one of them.

Growing up in Queens, New York, Stewart would wander over to a nearby airfield to admire the mammoth aluminum birds and fantasize about flying. He would finally realize his dream in 1944, when he began escorting American bombers to their targets across Europe.

During one such mission on Easter Sunday 1945, Stewart and six squadron mates were flying 5,000 feet above Nazi-occupied Austria when suddenly they found themselves outnumbered by Luftwaffe planes. Deadly dogfights ensued, Stewart squeezing off burst after burst from his P-51 Mustang’s six .50-caliber machine guns. Landing back at his base in Italy, he was greeted with fanfare and credited with downing three enemy aircraft—a feat for which he was awarded the Distinguished Flying Cross.

But the rookie fighter pilot was thinking of three fellow aviators shot down in the battle. One died instantly, one managed to crash-land in Yugoslavia, and one bailed out, his body reportedly discovered in Austria after the country was liberated from the Nazis two weeks later.

After the war Stewart stayed in the Air Force—President Harry Truman mandated racial integration of the military in 1948—and he won the inaugural “top gun” competition with two fellow Tuskegee pilots in 1949. A year later, postwar budget cuts forced thousands of officers, including Stewart, out of the Air Force. He earned his commercial pilot’s license on the GI Bill and applied to fly for Pan American and Trans World Airlines. They rejected him. They didn’t hire black pilots then.

The loss of his wings and dignity seeped in. But Stewart had a history of overcoming obstacles. He applied to New York University and earned a degree in mechanical engineering. He found employment and success as an engineer, traveling around North America, the Far East, and Europe. His last job took him to Michigan, where he rose through the ranks at one of the nation’s largest natural gas pipeline companies and retired as a vice president.

In 2018 Stewart traveled to Austria for the first time since the war, this time as a guest of the Austrian government. Researchers investigating the fate of downed Allied pilots had determined that Stewart’s squadron mate Walter Manning, the one who had bailed out during the bloody Easter mission, had been captured alive.

While awaiting transfer to a prisoner of war camp, the 24-year-old had been lynched by a mob incited by racist Nazi propaganda. Exactly 73 years later, Stewart and his daughter looked on as Austrian dignitaries apologized for the atrocity and dedicated a memorial.

Stewart says he never expected to see the Tuskegee Airmen acknowledged in museums and memorials, and written into history books and Hollywood films. His hope for their legacy? “I just want them to be remembered as good citizens—good Americans who felt duty-bound to join in protecting their country during times of need, even in the face of discrimination.”

—Katie Sanders

BREAKING THE AXIS

January 1942: Europe is in Hitler's grasp, but the Allies are striking back. They're pushing Axis forces out of North Africa while Soviet armies are fighting fierce battles of attrition in the east. The largest amphibious invasion in history, on the shores of Normandy in 1944, opens a new western front.

Axis dominance, January 1942

- Axis country or occupied territory
- Axis ally or dependency
- Allied country
- Allied-held area
- Neutral country
- Extermination camp

Allied war efforts

- Major battle
- Allied naval victory
- Allied offensive advance

DATES OF LIBERATION ARE SHOWN IN PURPLE.

Battle of the Atlantic
SEPT. 3, 1939–MAY 8, 1945

FINLAND
Co-belligerent with Axis, fought only Soviet Union

Siege of Leningrad
SEPT.

Leningrad (St. Petersburg)

NORWAY

Oslo

Helsinki

Stockholm

Reval (Tallinn) SEPT. 22, 1944

ESTONIA

SWEDEN

North Sea

OCT. 13, 1944
Riga

LATVIA

Siege of Königsberg
JAN. 25–APR. 9, 1945

SEPT. 25, 1943
Smolensk

LITHUANIA

Kaunas
AUG. 1, 1944

UNITED KINGDOM

IRELAND

Dublin

DENMARK

Copenhagen

E. PRUSSIA (GER.)

Danzig (Gdańsk)
MAR. 30, 1945

Minsk
JULY 3, 1944

OPERATION MARKET GARDEN
SEPT. 17–25, 1944

Hamburg
MAY 3, 1945

Fall of Berlin
APR. 16–MAY 2, 1945

OPERATION BAGRATION
JUN. 19–AUG. 19, 1944

Battle of Britain

London

London Blitz

NETH.

Amsterdam

Berlin

JAN. 17, 1945
Warsaw

Pinsk
JULY 14, 1944

POLAND

Kiev
NOV. 6, 1943

Dnieper
AUG. 26–DEC.

Rhine

Elbe

BELGIUM

Brussels
SEPT. 3, 1944

Torgau
APR. 25, 1945–U.S. AND SOVIET FORCES MEET

Dresden

OPERATION OVERLORD
JUNE 6–AUG. 30, 1944

English Channel

GERMANY

SLOVAKIA

Lvov JULY 27, 1944

The Bulge
DEC. 16, 1944–JAN. 25, 1945

Prague

Seine

NORMANDY

LUX.

CARPATHO-RUTHENIA

Paris
AUG. 25, 1944

FRANCE

Bratislava

Danube

Loire

Munich
APR. 30, 1945

Vienna
APR. 13, 1945

Budapest FEB. 13, 1945

HUNGARY

Bern

SWITZ.

LIECH.

Vichy

Lyon
SEPT. 3, 1944

Bordeaux

VICHY FRANCE

APR. 29, 1945
Milan

Trieste
MAY 3, 1945

Po

Turin

CROATIA

OCT. 20, 1944
Belgrade

Bucharest
AUG. 31, 1944

SERBIA (GER.)

Danube

SAN MARINO

DALMATIA (ITALY)

YUGOSLAVIA

Toulouse

AUG. 28, 1944
Marseille

MONACO

ITALY

MONTENEGRO (ITALY)

BULGARIA

Sofia

ANDORRA

OPERATION DRAGOON
AUG. 15–SEPT. 14, 1944

Corsica (VICHY FR.)
OCT. 4, 1943

Monte Cassino
JAN. 24–MAY 18, 1944

Rome
JUNE 4, 1944

Anzio
JAN. 22–JUNE 5, 1944

Naples

ALBANIA (ITALY)

Salonika (Thessaloníki)

ATLANTIC OCEAN

PORTUGAL

Madrid

Lisbon

SPAIN

Sardinia
SEPT. 18, 1943

ITALIAN CAMPAIGN
JULY 9, 1943–MAY 7, 1945

GREECE
(GER., IT., BULG.)

Taranto
NOV. 11, 1940

Mediterranean Sea

OPERATION HUSKY
JULY 9–AUG. 17, 1943

Messina

Palermo

Sicily

Athens

from U.S.

(Tanger) Tangier (International Zone)

GIBRALTAR (U.K.)

SPANISH MOROCCO (SPAIN)

Tetuán (Tétouan)

from U.K.

Algiers

Ops. Vulcan and Strike
APR. 22–MAY 12, 1943

MAY 7, 1943
Tunis

Oran

Constantine

TUNISIA (VICHY FR.)

MALTA (U.K.)

Crete
MAY 20–JUN. 1, 1941

Cape Matapan
MAR. 27–29, 1941

Crete

DODECAN (ITALY)

Port Lyautey (Kenitra)

Rabat

Casablanca
NOV. 11, 1942

OPERATION TORCH
NOV. 8–16, 1942

ALGERIA (VICHY FR.)

Kasserine Pass
FEB. 19–25, 1943

Siege of Malta
JUNE 11, 1940–NOV. 20, 1942

Safi

El Guettar
MAR. 23–APR. 3, 1943

Mareth Line
MAR. 16–31, 1943

WESTERN DESERT CAMPAIGN
JUNE 11, 1940–FEB. 4, 1943

Gazala
MAY 26–JUNE 21, 1942

FRENCH MOROCCO (VICHY FR.)

AFRICA

Medenine
MAR. 6, 1943

Tripoli

TUNISIAN CAMPAIGN
NOV. 17, 1942–MAY 13, 1943

JAN. 23, 1943

NOV. 20, 1942
Benghazi

Front line
JAN. 1, 1942

CYRENAICA

LIBYA (ITALY)

250 mi
250 km

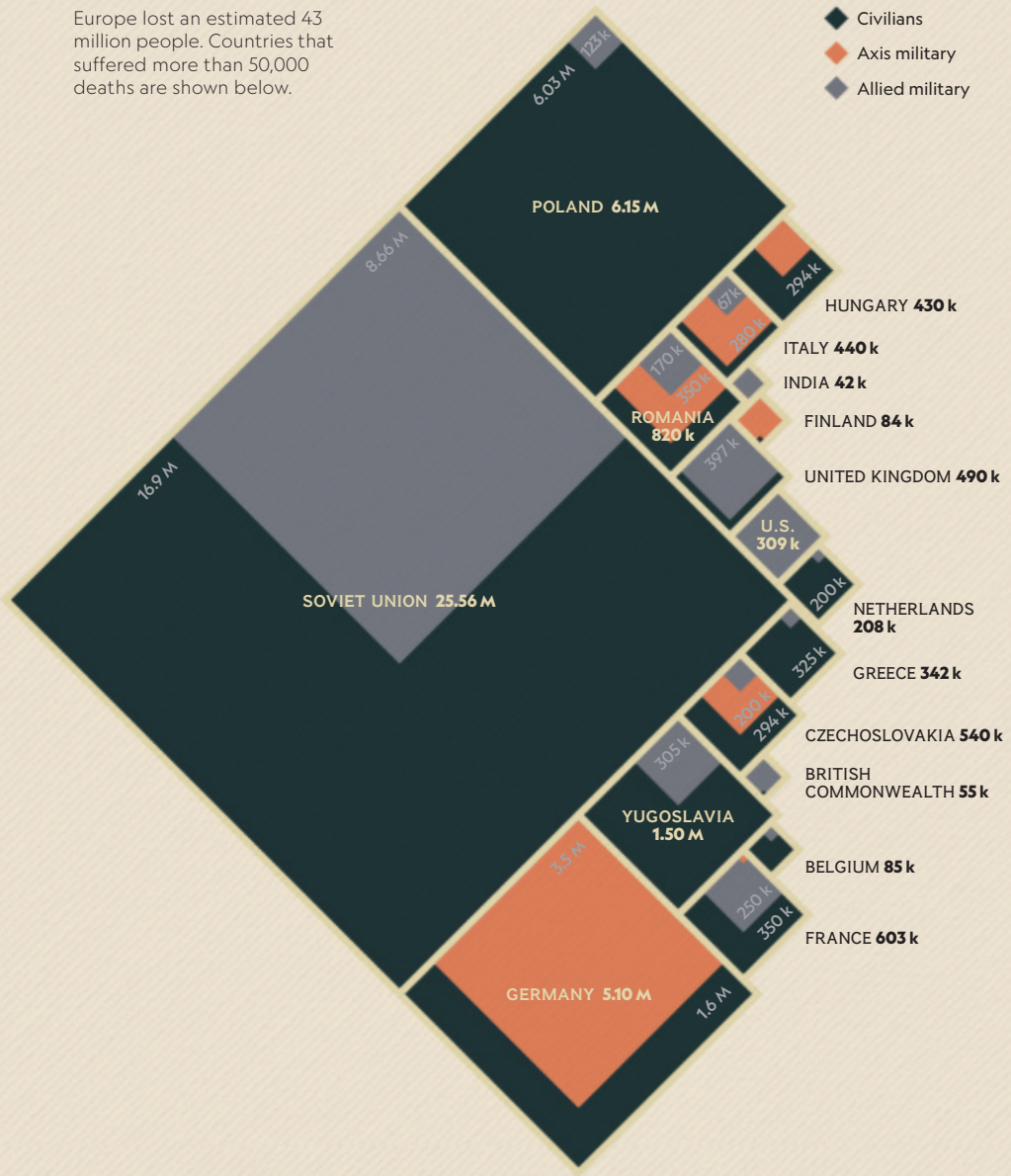
Boundaries shown as of September 1939

MATTHEW W. CHWASTYK, NGM STAFF
SOURCES: CRAIG L. SYMONDS, U.S. NAVAL WAR COLLEGE; NICK REYNOLDS, ARMY HISTORICAL FOUNDATION

Allies' relentless bombing
Britain's Royal Air Force strikes German cities by night, while the U.S. Army Air Force attacks industrial targets by day. The firebombing of Dresden kills some 25,000 civilians.
Moscow
Hitler's hate-fueled tactics
Hitler conducts Operation Barbarossa—the invasion of the Soviet Union—with utmost brutality. Over half the 5.7 million Soviet POWs die in captivity.
Eastern Front JAN. 1, 1942
I E T U N I O N
Voronezh
Volga
Don
Stalingrad (Volgograd)
Stalingrad
Caspian Sea
Rostov FEB. 14, 1943
Eastern Front after German offensive toward Caucasus NOV. 24, 1942
Sea of Azov
Crimea
Caucasus Mountains
Siege of Sevastopol
OCT. 30, 1941–JULY 4, 1942
Black Sea
IRAN (Occupied by U.K. and Soviet Union)
Ankara
A S I A
T U R K E Y
SYRIA (Free France)
IRAQ (Occupied by U.K.)
CYPRUS (U.K.)
LEBANON (Free France)
PALESTINE (U.K. mandate)
TRANSJORDAN (U.K. mandate)
SAUDI ARABIA
Battle for Africa
Along the North African coasts, Axis and Allied forces fight highly mobile battles from September 1940 until May 1943. The Allies' dependable supply chain helps secure their victory.
Alexandria
Cairo
Alam el Halfa
AUG. 30–SEPT. 5, 1942
EGYPT (U.K. protectorate)

DEATHS IN THE EUROPEAN THEATER

Europe lost an estimated 43 million people. Countries that suffered more than 50,000 deaths are shown below.



THE TOLL

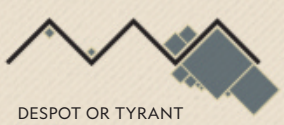
More than **66 MILLION** civilians and fighters died

ROOTS OF VIOLENCE

Brutal events often have myriad, overlapping causes. Here, up to three drivers of violence (organized by color) have been selected for each incident depicted below.

WAR OF CONQUEST

The primary objective of a country or nation is to gain control of other countries for territorial expansion.



DESPOT OR TYRANT

A corrupt ruler uses absolute power to advance personal aims through oppressive means.

RELIGIOUS CONFLICT

Religious motivations are often a key driver, one that typically results in larger acts of violence.

COLLAPSED STATE

Disputes and mass disorder lead to government collapse; regions are divided among warlords.

COLONIAL EXPLOITATION

Lives are lost as a region has its resources, and often its people, extracted by an external entity.

MEDIEVAL AGE *476–1450*

Guns, gunpowder, and artillery transformed warfare by the 1300s. The "gunpowder age" began in East Asia and spread to Europe, drastically changing military technology and political structures.

13. An Lushan Rebellion **13 M** *(755-763)*

8. Mideast Slave Trade **18.5 M** *(7th-19th centuries)*

Demand for labor escalated the slave trade along Africa's east coast and in the Sahara.

59

55

30. Crusades **3 M** *(1095-1291)*

29. Hundred Years' War **3.5 M** *(1337-1453)*

37

72

67

62

48

49

17. Fall of the Yuan Dynasty **7.5 M** *(1340-1370)*

98

82

26. Napoleonic Wars **4 M** *(1792-1815)*

14. Xin Dynasty **10 M** *(9-24)*

19. Decline and Fall of the Western Roman Empire **7 M** *(395-476)*

25. Three Kingdoms of China **4.1 M** *(189-280)*

46

71

40

83

58

84

96

94

47

28. Gladiatorial Games **3.5 M** *(264 B.C.-A.D. 435)*

61

97

2. Genghis Khan **40 M** *(1206-1227)*

The charismatic leader united Mongol tribes of nomadic horsemen and brutally conquered nations all across Central Asia, founding the Mongol Empire in 1206. It's estimated that over 10 percent of the world's population was annihilated.

9. Timur **17 M** *(1370-1405)*

The last of the Mongol conquerors violently swept through Central Asia, killing millions.

5. Fall of the Ming Dynasty **25 M** *(1635-1662)*

A cultural peak of Chinese civilization, this dynasty was also beset by corruption and lawlessness, opening China to conquest by neighboring Manchu.

10. Atlantic Slave Trade **16 M** *(1452-1807)*

Deaths occurred in Africa, at sea, and during the slaves' first year in the Americas.

11. Conquest of the Americas **15 M** *(beginning 1492)*

45

54

73

22. The Time of Troubles **5 M** *(1598-1613)*

18. Thirty Years' War **7.5 M** *(1618-1648)*

31. French Wars of Religion **3 M** *(1562-1598)*

ANCIENT WORLD *500 B.C.–A.D. 476*

Wealth was agricultural or took the form of tangible goods, making war an efficient way to acquire resources. War could drain agrarian workforces and hamper cultivation, causing massive death tolls.

INDEX OF THE ATROCITIES (*with deaths under 2.5 million*)
Incidents with the same estimated death toll are listed in order by date of occurrence.

36. Expulsion of Germans from Eastern Europe **2.1 M** *(1945-1947)*
37. Fang La Rebellion **2 M** *(1120-1122)*
38. Mengistu Haile **2 M** *(1974-1991)*
39. Democratic Kampuchea **1.67 M** *(1975-1979)*
40. Age of Warring States **1.5 M** *(475 B.C.-221 B.C.)*
41. Seven Years War **1.5 M** *(1756-1763)*
42. Shaka **1.5 M** *(1816-1828)*
43. Bangladesh Genocide **1.5 M** *(1971)*
44. Soviet-Afghan War **1.5 M** *(1979-1992)*
45. Aztec human sacrifice **1.2 M** *(1440-1521)*
46. Qin Shi Huang Di **1 M** *(221 B.C.-210 B.C.)*
47. Roman slave wars **1 M** *(134 B.C.-71 B.C.)*
48. Maya Collapse **1 M** *(790-909)*
49. Albigensian Crusade **1 M** *(1208-1229)*
50. Panthay Rebellion **1 M** *(1855-1873)*
51. Mexican Revolution **1 M** *(1910-1920)*
52. Biafran War **1 M** *(1966-1970)*
53. Rwandan Genocide **0.94 M** *(1994)*
54. Burma-Siam Wars **0.9 M** *(1550-1605)*
55. Hulagu Khan's campaign **0.8 M** *(1255-1260)*
56. Mozambican Civil War **0.8 M** *(1975-1992)*
57. French conquest of Algeria **0.78 M** *(1830-1847)*
58. Second Punic War **0.77 M** *(218 B.C.-202 B.C.)*
59. Justinian's Western Wars **0.75 M** *(527-565)*
60. Italo-Ethiopian War **0.75 M** *(1935-1941)*
61. Gallic War **0.7 M** *(58 B.C.-51 B.C.)*
62. Chinese conquest of Vietnam **0.7 M** *(1407-1428)*
63. War of the Spanish Succession **0.7 M** *(1701-1713)*
64. Iran-Iraq War **0.7 M** *(1980-1988)*
65. American Civil War **0.69 M** *(1861-1865)*
66. Hui Rebellion **0.64 M** *(1862-1873)*
67. Goguryeo-Sui Wars **0.6 M** *(598, 612)*
68. Sino-Dzungar War **0.6 M** *(1755-1757)*
69. Algerian War **0.52 M** *(1954-1962)*
70. Syrian Civil War **0.51 M*** *(2011-today)*
71. Alexander the Great **0.5 M** *(336 B.C.-325 B.C.)*
72. Bahmani-Vijayanagara War **0.5 M** *(1366)*
73. Russo-Tatar War **0.5 M** *(1570-1572)*
74. War of the Austrian Succession **0.5 M** *(1740-1748)*
75. Russo-Turkish War **0.5 M** *(1877-1878)*
76. Partition of India **0.5 M** *(1947)*
77. Indonesian Purge **0.5 M**** *(1965-1966)*
78. Angolan Civil War **0.5 M** *(1975-1994)*
79. Ugandan Bush War **0.5 M** *(1979-1986)*
80. Somalian chaos **0.5 M** *(1991-today)*
81. War of the Triple Alliance **0.48 M** *(1864-1870)*
82. Franco-Prussian War **0.43 M** *(1870-1871)*
83. First Punic War **0.4 M** *(264 B.C.-241 B.C.)*
84. Third Mithridatic War **0.4 M** *(73 B.C.-63 B.C.)*
85. Cromwell's invasion of Ireland **0.4 M** *(1649-1652)*
86. Haitian Slave Revolt **0.4 M** *(1791-1803)*
87. Mexican War of Independence **0.4 M** *(1810-1821)*
88. Greco-Turkish War **0.4 M** *(1919-1922)*
89. French Indochina War **0.39 M** *(1945-1954)*
90. Great Turkish War **0.38 M** *(1682-1699)*
91. Great Northern War **0.37 M** *(1700-1721)*
92. Cuban Revolution **0.36 M** *(1895-1898)*
93. Spanish Civil War **0.36 M** *(1936-1939)*
94. Roman-Jewish Wars **0.35 M** *(66-74, 132-135)*
95. Sanctions against Iraq **0.35 M** *(1990-2003)*
96. Second Persian War **0.3 M** *(480 B.C.-479 B.C.)*
97. War of the Allies **0.3 M** *(91 B.C.-88 B.C.)*
98. Crimean War **0.3 M** *(1854-1856)*
99. Idi Amin **0.3 M** *(1971-1979)*
100. Saddam Hussein **0.3 M** *(1979-2003)*

RENAISSANCE AND EXPLORATION *1450–1650*

Advanced shipbuilding techniques and the creation of large standing armies contributed to western Europe's rise as a world power as it sought fortune in the New World.

COLONIAL REVOLT

Civil insurrections and rebellions are undertaken to overthrow colonial control.

HUMAN SACRIFICE

Ritualized killing is performed as an offering for the maintenance of societal and spiritual order.

DYNASTIC DISPUTE

Two or more individuals vie over their right to become the successor to the throne in a monarchy.

WAR OF DOMINATION

Fights for dominance among nations transform the power structure of an international system.

ETHNIC CLEANSING

A dominant group executes varying forms of violence or forced removal on other ethnic groups.

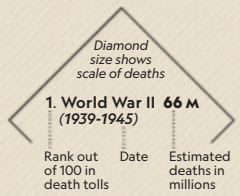
INTERNAL CLASH

Fighting inside a country ignites, often over ethnic, religious, linguistic, or political differences.

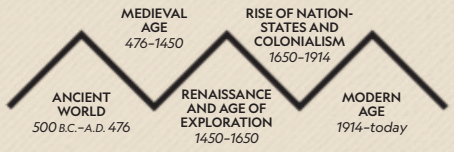
RISE OF NATION-STATES AND COLONIALISM *1650–1914*

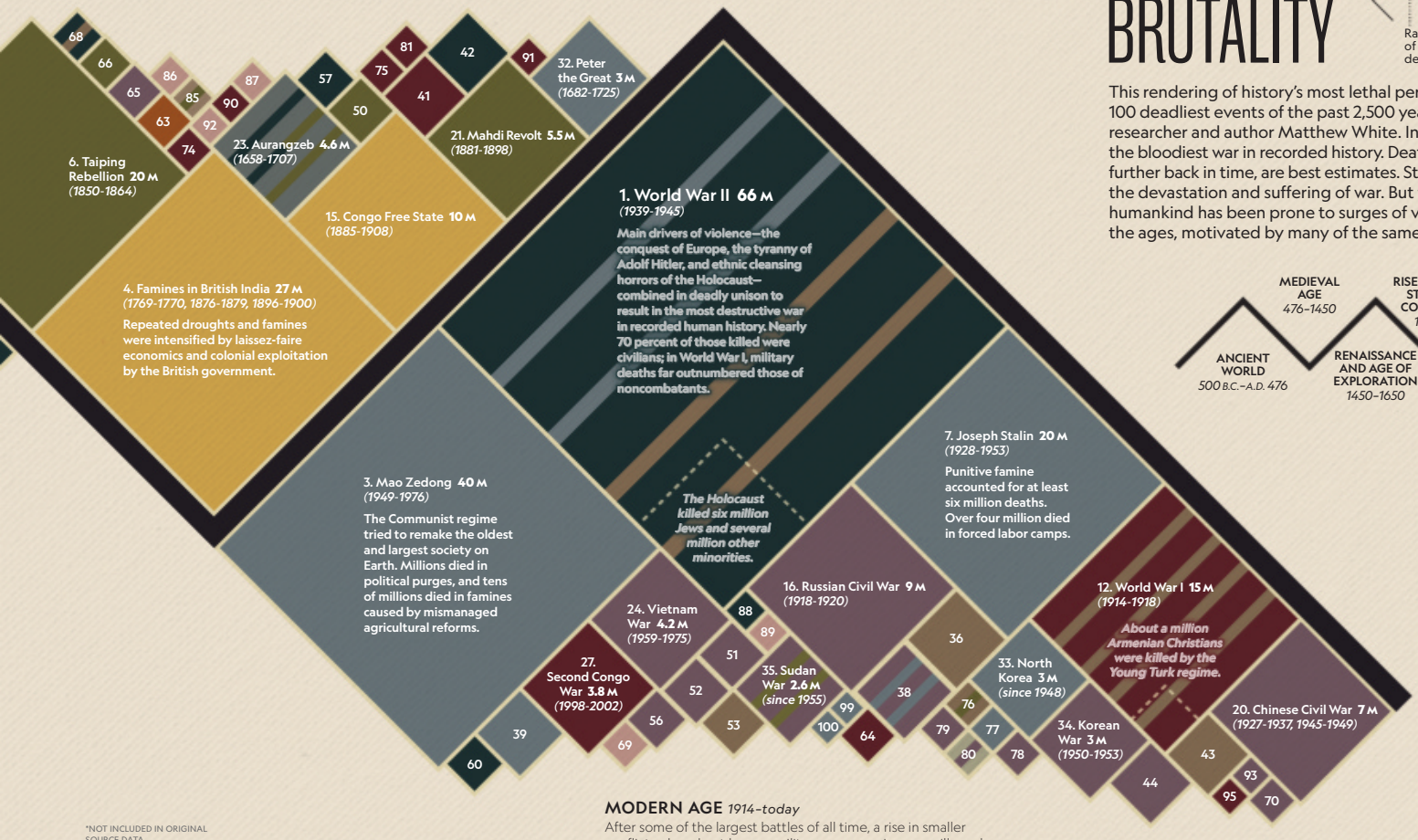
In an era of industrial development and the rise of nation-states, it was Europeans, predominantly the British with their strong army and navy, who were able to expand their political control across the globe.

PEAKS OF BRUTALITY


Diamond size shows scale of deaths
1. World War II 66 M
(1939-1945)
Rank out of 100 in death tolls
Date
Estimated deaths in millions

This rendering of history's most lethal periods highlights the 100 deadliest events of the past 2,500 years, based on work by researcher and author Matthew White. In 1945 WWII became the bloodiest war in recorded history. Death tolls, especially those further back in time, are best estimates. Statistics can't fully reflect the devastation and suffering of war. But they illustrate how humankind has been prone to surges of violence throughout the ages, motivated by many of the same timeless drivers.





MODERN AGE *1914–today*

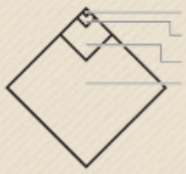
After some of the largest battles of all time, a rise in smaller conflicts played out by paramilitary groups using guerrilla and counterinsurgency tactics ensues. Information becomes a weapon.

*NOT INCLUDED IN ORIGINAL SOURCE DATA
**DEATH TOLL UPDATED WITH MOST RECENT ESTIMATE

ALBERTO LUCAS LÓPEZ AND KAYA LEE BERNE, NGM STAFF

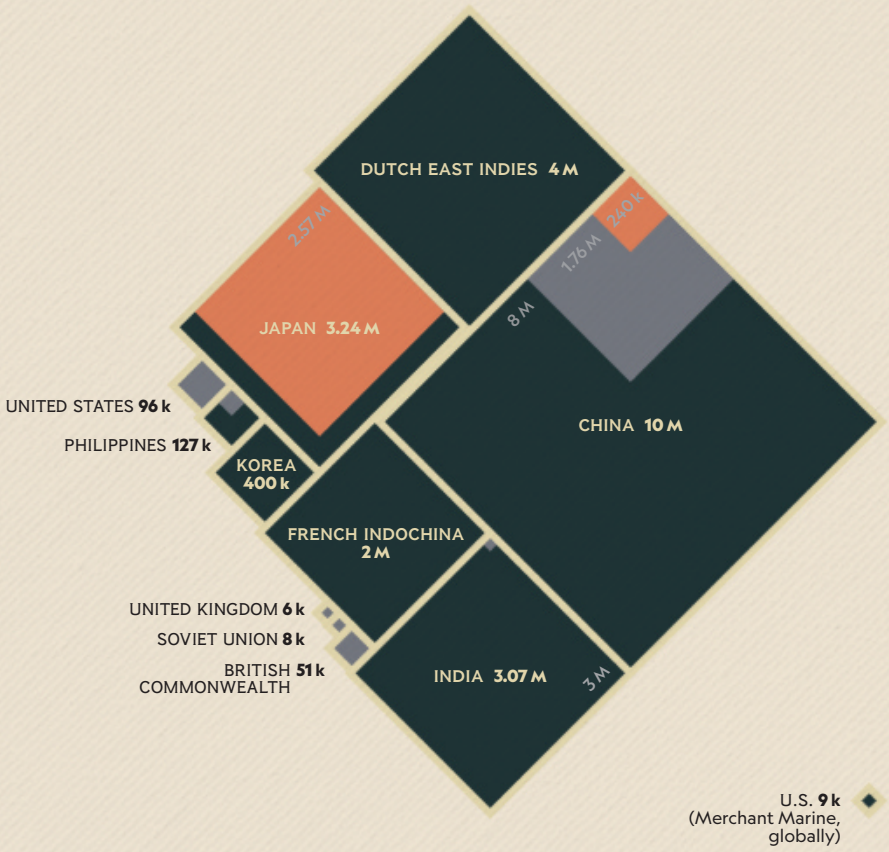
SOURCES: MATTHEW WHITE, *THE GREAT BIG BOOK OF HORRIBLE THINGS*; BEN KIERNAN, YALE UNIVERSITY; PETER BRECKE, GEORGIA INSTITUTE OF TECHNOLOGY

DEATHS IN THE PACIFIC THEATER



The Pacific region lost an estimated 23 million people. Countries that suffered more than 50,000 deaths are shown below.

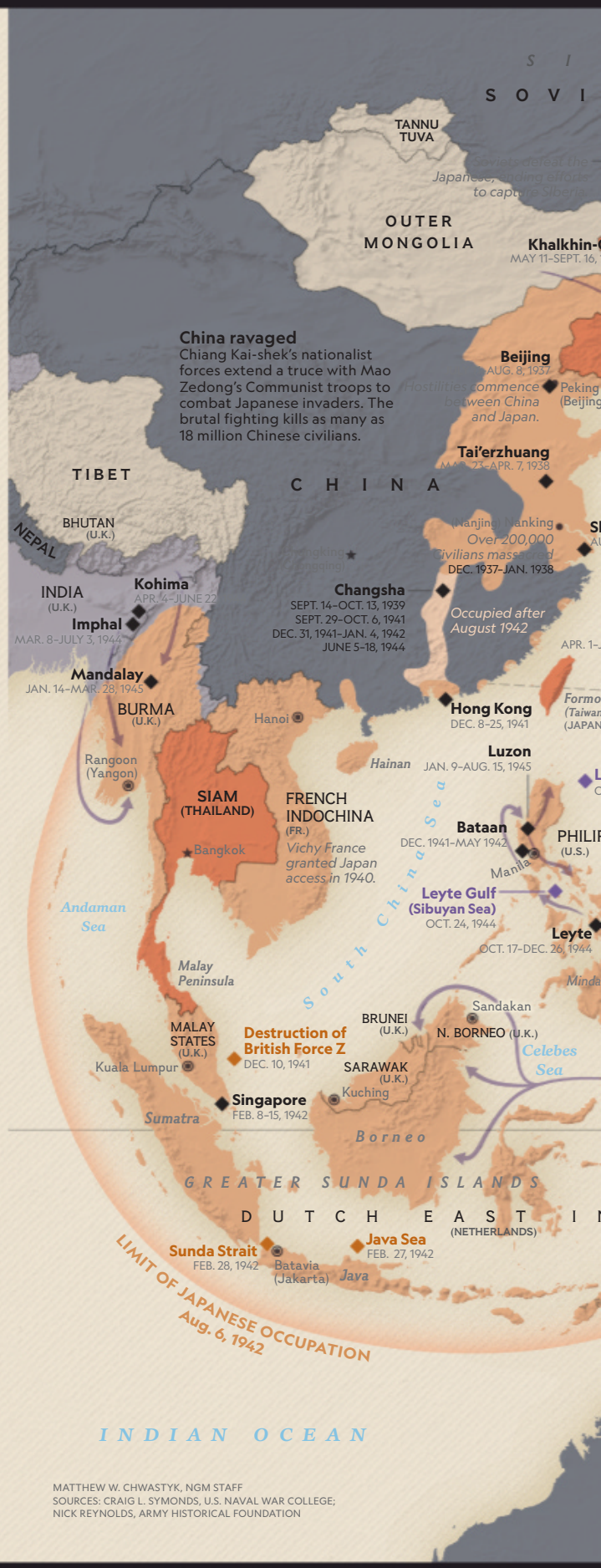
SOURCE: MATTHEW WHITE, NECROMETRICS PROJECT



OF WAR

in recorded history's **BLOODIEST CONFLICT.**

BY **ALBERTO LUCAS LÓPEZ, MATTHEW W. CHWASTYK,** AND **KAYA LEE BERNE**



MATTHEW W. CHWASTYK, NGM STAFF
SOURCES: CRAIG L. SYMONDS, U.S. NAVAL WAR COLLEGE; NICK REYNOLDS, ARMY HISTORICAL FOUNDATION

DEFEATING JAPAN

August 1942: Japanese forces dominate land and sea, from eastern China to the Solomon Islands. But Allied forces led by the U.S. are about to mount a two-pronged strategy to dislodge them. Naval, land, and air forces under Gen. Douglas MacArthur and Adm. William Halsey concentrate on the eastern and South Pacific, while Adm. Chester Nimitz retakes islands in the central Pacific. The British fight back the Japanese in Burma.

Atomic inferno
On August 6, 1945, the U.S. drops an atomic bomb on Hiroshima, then one on Nagasaki three days later. Nearly 200,000 people are killed, up to 80,000 of them instantly. Japan surrenders on August 15, 1945.

Island assaults
U.S. strategy is to attack Japanese island garrisons, landing troops backed by heavy air and naval support. Bypassed island bases are isolated to "wither on the vine," according to General MacArthur's strategy.

Day of Infamy
The Japanese surprise attack on December 7, 1941, at Pearl Harbor kills 2,403 Americans, damages or sinks 21 warships, and destroys 169 aircraft. The United States declares war the next day.

Japan loses four aircraft carriers, changing the course of the war.

Japanese dominance, August 1942
- Japanese territory, ally, or puppet country
- Japanese-occupied territory
- Allied country
- Allied-held territory
- Neutral country

Allied war efforts
- Major land battle
- Allied naval victory
- Japanese naval victory
- Allied offensive advance

Sea battles near Guadalcanal
- Savo Island AUG. 8–9, 1942
- Eastern Solomons AUG. 23, 1942
- Cape Esperance OCT. 11–12, 1942
- Guadalcanal NOV. 12–15, 1942
- Tassafaronga NOV. 30–DEC. 1, 1942

500 mi
500 km

Boundaries shown as of September 1939

ALASKA (U.S.)
UNITED STATES
Bering Sea
Sea of Okhotsk
Aleutian Islands
Komandorski MAR. 26, 1943
Attu MAY 11–30, 1943
Kiska
Route of Pearl Harbor attack fleet
MANCHUKUO (MANCHURIA) (JAPAN)
Changkufeng Incident
Hsinking (Changchun)
Hokkaido
Sea of Japan (East Sea)
CHOSEN (KOREA) (JAPAN)
Keijo (Seoul)
JAPAN
Honshu
Tokyo
Hiroshima
Nagasaki
Kyushu
Yellow Sea
East China Sea
Ryukyu Is.
Doolittle Raid APR. 18, 1942
Carrier-launched B-25 bombers attack Tokyo and other cities.
Okinawa JUNE 22, 1945
Iwo Jima FEB. 19–MAR. 26, 1945
Midway JUNE 3–6, 1942
Midway Is. (U.S.)
NORTH PACIFIC OCEAN
TROPIC OF CANCER
Kazan Retto (Volcano Is.)
Marcus I. (JAPAN)
Honolulu
Pearl Harbor DEC. 7, 1941
HAWAII (U.S.)
LIMIT OF JAPANESE OCCUPATION Aug. 6, 1942
Leyte Gulf (Cape Engaño) OCT. 25, 1944
Philippine Sea
Mariana Islands (JAPAN)
Saipan JUNE 15–JULY 9, 1944
Guam JULY 21–AUG. 10, 1944
Tinian JULY 24–AUG. 1, 1944
Philippine Sea JUNE 19–20, 1944
Leyte Gulf (Off Samar) OCT. 25, 1944
Leyte Gulf (Surigao Strait) OCT. 24–25, 1944
JAPANESE SOUTH SEAS ISLANDS (JAPAN)
Palau Is.
Peleliu SEPT. 15–NOV. 27, 1944
Caroline Is.
Wake I. (U.S.)
Eniwetok
Kwajalein JAN. 31–FEB. 4, 1944
Marshall Islands (JAPAN)
Truk (Chuuk)
Operation Hailstone FEB. 17–18, 1944
Morotai
Biak MAY 27–AUG. 17, 1944
Makin
Tarawa NOV. 20–28, 1943
Gilbert Islands (U.K.)
EQUATOR
Cape St. George NOV. 25, 1943
Empress Augusta Bay NOV. 1–2, 1943
Bismarck Sea MAR. 2–4, 1943
Vella Lavella OCT. 6–7, 1943
Aitape JULY 11–AUG. 10, 1944
N.E. NEW GUINEA (AUS.)
New Guinea
Kula Gulf; Kolombangara JULY 5–6, 1943; JULY 12–13, 1943
SOLOMON ISLANDS (U.K.)
Guadalcanal AUG. 7, 1942–FEB. 9, 1943
PAPUA (AUS.)
Buna-Gona NOV. 16, 1942–JAN. 22, 1943
Port Moresby
Dili
PORTUGUESE TIMOR
Vella Gulf AUG. 6–7, 1943
Santa Cruz Is. OCT. 26–27, 1942
Coral Sea MAY 4–8, 1942
Darwin
Cairns
AUSTRALIA
Coral Sea
NEW HEBRIDES (U.K. & FR.)
Vila
SOUTH PACIFIC OCEAN
FIJI (U.K.)

‘You were an old man if you were still there at 23. IF WE LET IT BOTHER US, it would destroy us. You just had to go on.’

Grammy-winning producer, playwright, and actor Eugene Polinsky flew clandestine missions over Nazi-occupied Belgium, France, and Norway during the war. Instead of unleashing bombs, his eight-man American crew dropped Allied agents, weapons, motorbikes, cash, and other vital supplies to resistance fighters as part of a mission called Operation Carpetbagger. “I didn’t know what I was doing then,” says Polinsky, now 99. “I didn’t know what I was carrying. I would have been terrified!”

The Carpetbaggers were the air arm of the Office of Strategic Services (OSS), the U.S. intelligence agency that ran espionage and sabotage operations. Between 1944 and 1945 the Carpetbaggers dropped more than 500 agents and some 5,000 tons of supplies into hostile territory. They flew late and low, so low that the planes’ bellies snagged tree branches. “They told us, ‘If you’re shot down, if they capture you, you’ll be shot as a spy,’ ” Polinsky says. “ ‘So don’t get shot down.’ Great advice.”

Born in Manhattan on September 11, 1920, Polinsky was the son of Russian Jewish immigrants. When he arrived in England for duty with the Eighth Air Force, his crew was assigned to stripped-down B-24 Liberators, painted black to blend into the night. Hours before a mission, the ground crew loaded supply containers into the plane’s bomb bay. Just before takeoff, agents known to the airmen only as “Joes” and “Josephines” sometimes slipped aboard.

As navigator, Polinsky squatted on a gun case toward the nose of the cramped, freezing Liberator, directing the pilot to the target. When they neared the drop zone, the pilot dipped down as low as 300 feet, and upon spotting signal lights from Allies below, the dispatcher sent the night’s load parachuting out. Back in England, officers waited and hoped the number of crews that took off the previous night would match the number that landed before the sun rose. But 42 Carpetbagger planes never returned, and 21 more were mangled beyond repair. More than 200 of Polinsky’s fellow airmen ended up missing, imprisoned, or killed in combat. “You saw the 18- and 19-year-olds come in as replacements,” Polinsky recalls. “You were an old man if you were still there at 23. If we let it bother us, it would destroy us. You had to just go on.”

In August 1944, after a successful drop over Belgium, Polinsky’s crew returned from their 35th mission—the magic number for a ticket home. Their final orders were to “forget everything.” And so he did for many years.

Then, in 2001, Polinsky received a mysterious invitation to a reception in Belgium celebrating a new book about an elaborate Allied operation to liberate the Port of Antwerp in 1944. Polinsky never knew he had played an important part in the mission until his host, the former head of the Belgian resistance, told him the story. “We were friends all these years,” he said. “Only you were up in the air, and I was down on the ground.”

“You want your whole life to do something,” the veteran says. “To find out that you did it when you were just a kid and you didn’t know it, well—that’s a strange feeling.”

—Katie Sanders

COURTESY EUGENE POLINSKY (DIGITIZED BY PAST PRESENT PIX)

EUGENE POLINSKY

U.S. navigator

"Most of our operation was not to get noticed," says decorated airman Eugene Polinsky, who delivered spies and supplies behind enemy lines for the OSS, forerunner of the CIA. Polinsky (top row, second from left in wartime photo below) was navigator aboard a B-24 Liberator. He's now the last surviving member of his crew.

Between 1944 and 1945 the Carpetbaggers dropped more than 500 agents and some 5,000 tons of supplies into hostile territory.

IGOR MORSHTEIN AND VALENTINA LUKYANOVA

Soviet veterans

THEIR LIVES were intertwined by war, the siege of Leningrad, and 40 years as friends working in the same factory. But romance blossomed only after both were widowed. Valentina was raised in orphanages; Igor's mother died trying to evacuate their famine-ravaged city. One day Igor and some boys heard a child crying. "We went to look," he recalls. "We found a one-year-old baby trying to nurse from his mother lying dead next to him." That, he says, "was the beginning of our missions. We'd go door-to-door to look for orphaned children."

A drop-off place was organized, and babies were given the last names of the children who found them. "We didn't think to look for identification papers," Igor, 92, says. "We were boys, 12 to 14. We were not serious, but we felt the need that was there." By the time they were old enough to fight, "we were malnourished, we didn't have the strength to pick up our weapons." The army fed him, and he eventually helped liberate Leningrad from the Nazi stranglehold. Four years ago, he got a call from a veterans committee. A woman was looking for him. "It turns out I had found her as a baby during the siege and took her to the baby drop-off." She was named after him.

—Eve Conant

ARTHUR MADDOCKS

British code breaker

"I SUPPOSE THEY figured if I could understand economic theory, I could crack code," says Arthur Maddocks, 98, who was a top student at Oxford University when he was recruited by British intelligence. Like Betty Webb (page 60), Maddocks was posted to Bletchley Park. He was put to work cracking the Lorenz cipher, the encrypted messaging system used only by Hitler and his most senior generals. Lorenz had two layers of encryption and millions of possibilities to unravel. But by the time the war was drawing to a close, Maddocks and his colleagues—assisted by Colossus, the world's first large-scale digital computer—were reading communications between Nazi leaders so far in advance that Germany's surrender in May 1945 was something of an anticlimax, Maddocks says. "We already knew it was over." *—Roff Smith*

VALENTIN SHORIN

Leningrad survivor

HE WAS JUST FIVE when the Nazis began their nearly 900-day campaign to starve and shell Leningrad into submission. At first Valentin Shorin's mother kept working, and took him to kindergarten by trolley each day. Then the bombing started. Loudspeakers in the streets broadcast the air-raid alert, followed by a whistling sound and the thunder of collapsing buildings. Mother and son were constantly hungry, "but I figured it out later—she was giving me her rations as well," Shorin, now 83, says. Finally his mother grew too weak to walk. He remembers his aunt pulling her in a rag-filled wooden sled with one hand, and pulling him with the other. They reached his kindergarten. "I looked at my mom—it still hurts to this day. She had these big tears running down her face like streams, and I felt in my soul this was the last time I'd see her." He bit his aunt to break away, but his mother called out, "Valya, go, go. I'll get better and come pick you up." Instead, he says, "my kindergarten became my first orphanage."

—Eve Conant

HANS-ERDMANN SCHÖNBECK

German officer

HANS-ERDMANN Schönbeck survived one of the biggest, bloodiest battles in history. He looked Adolf Hitler in the eye. He slept a few feet from the bomb that nearly took the führer's life—and escaped the bloody purge that followed.

Now 97, Schönbeck has only one explanation: "I have had, in my life, whole squadrons of guardian angels looking after me. There's no other way."

Assigned to a German tank regiment in the summer of 1940, Schönbeck says he felt a part of the world's best army. For a year his unit rampaged across the Soviet Union. Eight tanks were shot out from under him, and he was given one field promotion after another. By the time his tank crested a hill overlooking Stalingrad in August 1942, he led an entire tank company. He wasn't quite 20 years old.

The next five months were a

turning point, for Germany and Schönbeck. Hundreds of thousands of German soldiers were cut off from their supply lines. The situation grew desperate in winter, when night temperatures plunged to lethal lows.

Schönbeck and his men tore down houses to burn for heat, turning their Russian inhabitants out into the snow. His tanks out of fuel, his men starving, Schönbeck shrank from a strapping young man to a 99-pound shadow. He was overcome by an unfamiliar emotion: doubt.

During cold nights the young officer listened to his men curse Hitler for abandoning them. Months earlier, saying such things would have meant execution. Now he found himself silently agreeing.

On January 19, 1943, Schönbeck was wounded by an artillery blast that punctured his lungs and shattered his shoulder. A sergeant shoved the young officer onto a German bomber. It took off minutes later, and Schönbeck became one of the few German soldiers to survive Stalingrad. The battle, one of the largest in history, was the start of the Wehrmacht's collapse on the Eastern Front, and of the end for Nazi Germany.

Ten months after his unlikely escape, the young officer briefly was assigned to guide Hitler's entourage through the streets of Breslau (now Wrocław, Poland). Schönbeck recalls rushing to open the führer's car door, snapping to attention, and saluting as Hitler emerged.

As he followed Hitler into a meeting hall, Schönbeck's thoughts darkened, thinking of the lives lost in Stalingrad. He fingered the pistol at his belt, then remembered Stalingrad again. "I thought, 'You've been given another chance at life. Do this and you'll surely die—and they'll kill your whole family.' "

He was assigned to an intelligence unit at a secret base where Hitler had a headquarters. As Schönbeck was delivering a briefing, his commander asked a strange question. "He said, 'If something big happens, we can count on you, right?' " Schönbeck recalls. He learned later that his fellow officers were plotting to assassinate Hitler and that his bunkmate had hidden explosives in their room. But the Stalingrad survivor kept to himself. "That's the thing about living in a dictatorship," he says. "You never knew who to trust."

When the plot failed, a bloody purge began. "My roommate was one of the first ones hanged," Schönbeck says.

After the war, he moved to Munich and got a job in Germany's booming postwar auto industry. He rose through the ranks, and in the 1980s he was head of the German Automotive Industry Association. "I lived, I made it," he says. "I wasn't going to waste that." *—Andrew Curry*

MALLIE MELLON

U.S. warplane builder

BORN IN A Kentucky farmhouse, Mallie Osborne Mellon, along with her husband and their young son, boarded a bus to Detroit in 1943, responding to a radio ad for civilian war jobs. By then more than 300,000 American women were involved in aircraft production, many by shooting rivets into warplanes in Motor City factories. Mellon worked at Briggs Manufacturing, burnishing parts for bombers rolling off the assembly line at Henry Ford's mammoth Willow Run plant nearby.

Mellon, now 100, hadn't heard of Rosie the Riveter—the term used to describe women who worked in defense plants—until five years ago, when she learned that she was one. Now she attends monthly American Rosie the Riveter Association gatherings. She still has her southern drawl, but Michigan is home, and the Rosies are family.

—Katie Sanders

‘We were in striped pajamas, LICE INFESTED. But we were polite, SPOKE THE TRUTH, and discussed what the world should be like.’

FRED TERNA

Holocaust survivor
Czechoslovakia

Soon after Fred Terna arrived at Terezín, a Nazi concentration camp, in 1943, he began sketching. He drew triple-level bunk beds, lines of people awaiting meager food rations, and the railroad tracks that transported prisoners to Auschwitz. He signed some sketches with a symbol so they couldn't be traced back to him. Drawing, he found, was a reminder of his humanity.

Terna was 16 years old when German troops marched into Prague, his hometown, in 1939. When American soldiers liberated him six years later, he says, he was "one of those shuffling skeletons." He had been held in four concentration camps and had starved, escaped, been caught, and frozen nearly to death. He returned to Prague and learned that no one else in his immediate family had survived the war.

Terna married a fellow camp survivor and eventually ended up in New York, where he became a full-time artist. Now, at 96, he still paints and lectures. In the top-floor studio of his Brooklyn home, he custom blends his own acrylic paint. "It's my stab at immortality," he says of the medium. Terna's canvases, thick with texture and fiery scenes, line the hallways. "We have left a record. My record is visual."

Nearly 40 years after the war, Terna discovered someone had saved his drawings from Terezín and taken them to Israel. "We didn't know then that I was actually making historical documents." Like the number tattooed on his arm—114974—they were evidence of what happened to him and to the six million Jews who perished in the Holocaust. "Yes, our families are gone, but their memory is kept alive," he says. "It's my obligation—and, in a way, it's now yours—to remind the world."

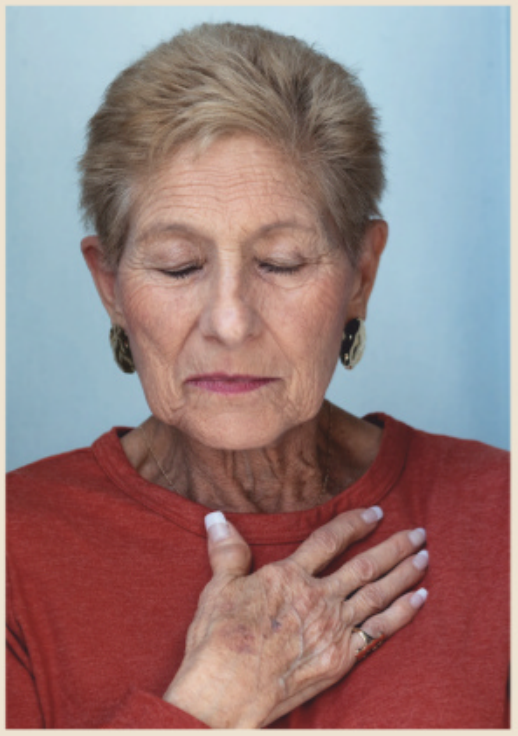
—Nina Strochlic

JEANNINE BURK

Holocaust survivor

WHEN JEANNINE BURK was three years old, her father took her on a streetcar across Brussels. He rang a stranger's doorbell, kissed his daughter goodbye, and left her with the woman who answered. He would be arrested by the Gestapo in a roundup of Jewish citizens, and later died in a gas chamber at Auschwitz. From 1942 to 1944, Burk remained hidden in the home of the Christian woman. She had food and shelter but little else. When Nazis paraded nearby, her helper ordered her to the outhouse. Burk would peek out through a gap between the boards, then retreat into the darkest corner.

In 1944 British soldiers arrived. Soon after, her mother, back from hiding in the countryside, came for her. Burk never saw her helper again. "I am 80 years old, and I still cry," says Burk. "I never had a chance to say thank you." *—Katie Sanders*



WALTRAUD PLESS

Child survivor
Germany

In the lean postwar years, millions of refugees displaced by the conflict were resented because they were extra mouths to feed.

‘They discriminated against us, cursed at us, JUST BECAUSE WE WERE REFUGEES… I was nine—the war wasn’t my fault.’

Even as a child, Waltraud Pless couldn’t help but see the way many Germans benefited from the Nazi regime. She didn’t have to look far: Her parents were broke when Hitler rose to power in 1933. Six years later her father was an officer in the Waffen-SS, the Nazi Party’s elite military division. By the time he went off to fight in the invasion of France, the family had two cars, a nice house, and a warehouse full of valuable “secondhand” furniture.

“Where did all his money come from?” Pless asks. “It’s clear to me now: It could only have come from Jewish households. No one can tell me he didn’t know Jews were persecuted.”

Her father once plopped her in the car for an errand to the Sachsenhausen concentration camp on the edge of Berlin. “I saw the people there, how they were living,” she says. Was she shocked? The impeccably dressed 84-year-old shakes her head and shrugs. “Things like that were just a given.”

Then, suddenly, they weren’t. In the fall of 1944, Pless saw the roads around their family’s home, more than a hundred miles east of Berlin, filling with families fleeing the Soviet army. For weeks she slept in her clothes, ready to join the river of refugees at any moment. Finally, on a freezing night in February 1945, the evacuation order came.

“I thought it was temporary,” she recalls. “As soon as the Russians were defeated, we’d be back home. That’s how powerful the [Nazi] propaganda was at the time.”

After weeks on the move, sleeping in strangers’ apartments and railway stations, she and her mother, brother, and sister were shipped to a peninsula on Germany’s Baltic coast, where a tourist destination had plenty of beds. But in April the rapidly advancing Soviets cut off access to the mainland, and there was nothing to eat.

Without electricity or radios, Pless and her family were unaware of Germany’s surrender until they heard celebratory gunfire from Soviet units garrisoned in nearby houses. Constantly hungry, Pless spent that spring searching for food. One day, she says, she followed a farmer’s cart as it bounced along a cobbled road, gathering spilled potatoes into her skirt. Before she knew it, she was alone in a field far from town. “That’s when a Russian soldier grabbed me and raped me,” she says. She was nine years old. Pless says she ran home to tell her mother, but her screams were met with silence.

That fall the family got word that Pless’s father had survived the fall of Berlin and was interned by the British in northern Germany. But there would be no going home: Their village was now Polish territory.

For the next decade the reunited family struggled, living first in pig stalls and barns, later crowding into small apartments with other families. In the lean postwar years, many Germans resented Pless and the millions of others displaced by the conflict as extra mouths to feed. “They discriminated against us, cursed at us,” she says, “just because we were refugees.”

Seventy-five years later, Pless feels neither anger nor guilt. “There are truly tragic stories out there. Mine, by comparison, is almost trivial,” she says. “I was nine—the war wasn’t my fault. But I’m not a victim either.”

Today Pless visits schools in the Hamburg area to talk about her wartime experiences, motivated, she says, by concern.

“Look at the world now: People haven’t learned. It’s horrifying that neo-Nazis are back, and not just in Germany, in the U.S., in Scandinavia. People are still so easily manipulated.”

—Andrew Curry

WHEN THE BOMB FELL

More than seven decades after its devastation, **HIROSHIMA HAS MOVED ON.** But for the remaining survivors, the horrors of a nuclear attack—**AND THE LESSONS OF WAR**—remain vivid.

By

TED GUP

NINE DAYS AFTER THE ATOMIC BOMB was dropped on Hiroshima, after his parents and year-old brother died and his home was incinerated, seven-year-old Masaaki Tanabe watched his father slip away. His last words: "I see no future as an army officer." An implacable enemy of America, Tanabe's father died with his sword at his side. Tanabe's grandfather wanted to keep his son's sword, but the occupation forces came and wrested it from him. "Barbarians," young Tanabe thought. He was determined to take revenge against America, he says. ¶ Understandable. He had nothing and almost no one left. His home had been next to Hiroshima Prefectural Industrial Promotion Hall, the now iconic building with the skeletal dome, preserved as an appeal for nuclear forbearance.

Now in his early 80s, Tanabe is a handsome man, square jawed and silver browed. He is tradition personified in his gray *jinbei* robe with wide sleeves. He's also resourceful and adaptive. He became a filmmaker and studied computer graphics so he could construct a cyber version of the city that the bomb had erased. The result: *Message From Hiroshima,* a film that includes interviews with survivors of the August 6, 1945, bombing that—along with the atomic bombing of Nagasaki three days later—would kill up to 200,000 people, force Japan's surrender in World War II, and render unnecessary an Allied invasion of Japan that could have killed millions.

Tanabe couldn't have predicted the wrenching changes that awaited him and Japan. His daughter married an American and settled in the United States. Tanabe long wrestled with the idea that she had embraced the enemy. Two or three years after the wedding, Tanabe discovered a letter his daughter had left at the base of a stone Buddha in Yamaguchi Prefecture, where her grandfather—Tanabe's father—had died. In it she told her grandfather she was sorry if she had disappointed him. As the years passed, Tanabe, like much of his generation, reconciled himself to a changed world.

Seventy-five years after the war's end, Tanabe's story is the story of Hiroshima, and of Japan itself: a mix of tradition and modernity, of a determination never to forget but also a commitment not to be defined solely by the past. And as with Tanabe, events personal and public have yoked the two former enemies, Japan and America, to a shared future.

Each August 6, the city pays homage to its 135,000-plus A-bomb victims, adding more names to a cenotaph. All other days of the year, its focus is decidedly forward. Today Hiroshima has a near-messianic zeal as the world's champion of denuclearization, but it's also a vibrant hub for recreation, research, and commerce.

AFTER THE BOMB FELL, Hiroshima was full of miraculous accounts of services restored—water, electricity, streetcars—and of unheralded

heroes from near and far who helped bring the city back to life in the years afterward.

Nanao Kamada grew up in the countryside nearly 400 miles from Hiroshima. Until 1955, when he was applying to medical school in the city, he hadn't thought much about the atomic bomb. But in Hiroshima he saw people wearing caps and long sleeves in searing heat, to conceal their burns. He would become an authority on treating A-bomb survivors and on radiation research.

Today Hiroshima's problems are those of many Japanese cities—a declining birth rate, an aging population, inadequate hotel capacity for its more than two million yearly visitors, and aging buildings and infrastructure. But there's a sense of urgency about preserving the memories of the survivors—the *hibakusha*. There are about 47,000 of them in Hiroshima; their average age is 82. The city has dispatched hibakusha around the world, in person and via the internet, to tell their stories. The Hiroshima Peace Memorial Museum has a video library of more than 1,500 survivors' tales, some 400 viewable online. Some survivors are even available for video conferencing. Many say that sharing their stories gives more meaning to what they endured.

FOR SOME SURVIVORS, the unfounded fears of other Japanese citizens became more of a burden than the aftereffects of radiation.

Shoso Kawamoto was 11 when the bomb fell. He lost his mother, two sisters, and a brother. His surviving sister died of leukemia at 17. Though orphaned, he was fortunate: Rikiso Kawanaka, the owner of a soy sauce business in Tomo, a village some seven miles from Hiroshima, took him in.

Kawanaka fed and clothed Kawamoto. He also

This panoramic view of Hiroshima, from U.S. Army images taken several weeks after the bombing, shows the scope of the damage. On the last page is the domed frame of Industrial Promotion Hall. It stands today as a symbol of the atomic bomb's devastation.

PHOTO: COURTESY HIROSHIMA PEACE MEMORIAL MUSEUM (10-FRAME PANORAMA DIGITALLY STITCHED BY ARI BESER)

made him an unusual offer: If the boy agreed to work for 12 years without a salary, Kawanaka would give him a house. Years passed. Kawamoto rose at two in the morning and worked until four in the afternoon—all without pay.

When Kawamoto turned 20, he met a woman named Motoko. She was pretty and easy to talk to. She was learning to make dresses and kimonos. They fell in love.

When Kawamoto turned 23, Kawanaka made good on his pledge: He gave Kawamoto the promised house. With his own home, Kawamoto felt ready to ask Motoko's father for permission to marry his daughter. But the father knew Kawamoto was from Hiroshima. He told him that any children the marriage might produce could be deformed from radiation (actually, no health effects have been found in children of Hiroshima survivors). He forbade the union.

Kawamoto was shattered. Two days later, with marriage denied him—as it has been for many hibakusha—he quit his job, walked away from the house for which he had sacrificed so much, and left his village. He never saw Motoko again and never again allowed himself to love, fearing more heartache. His life spiraled downward. He says he gambled and fell in with gangsters—yakuza. He considered suicide.

Eventually he found work in a noodle shop, his opportunities limited by his sixth-grade education and his status as a hibakusha, a modern-day leper to some. At 70, he returned to Hiroshima and there, finally, found some peace. Now 86, he's a grandfatherly figure in a straw hat and cotton vest, seen reaching into a shopping bag and pulling out origami planes and cranes. He gives them to children who visit the Hiroshima Peace Memorial Museum. Pull the tail, he says, beaming, and see the wings flap. Printed on the planes' wings are the words "Hope for Peace."

THERE IS NO UNDOING the discrimination Kawamoto and other survivors suffered. But at Hiroshima University's Research Institute for Radiation Biology and Medicine, director Satoshi Tashiro is determined to try to avoid

such future discrimination. The institute aims to improve communication between the media and scientists, so that the public is not swayed by unwarranted fears. What happened to the hibakusha, he says, also happens to those who lived near Russia's Chernobyl nuclear plant and Japan's failed Fukushima reactor.

The Funairi Mutsumien Nursing Home houses some hundred bomb survivors. The youngest, now 74, was in utero at the time of the blast. The oldest is Tsurue Amenomori; she's 103. When the bomb went off, she was less than a mile from ground zero, giving her bedridden parents medicine. She suffered burns on her face, hand, and leg. Today she is cheerful and prides herself on bounding up the nursing home's stairs. She's a favorite of the staff.

These survivors' care falls to the Atomic Bomb Survivors Support Division, which has a staff of 32 led by Takeshi Yahata, a son of hibakusha. His grandfather disposed of corpses after the bombing; now Yahata's division helps living survivors—with health care, social services, counseling, and nursing home and funeral expenses.

Even now, telling Hiroshima's story can be contentious. A new exhibit at the peace memorial museum took 16 years to complete, partly because of disputes among the exhibition committee, says Shuichi Kato, the museum's deputy director. Some members wanted stark pictures of the horrors of nuclear war; others argued for more restraint, afraid of traumatizing visitors. (During a recent visit I saw two people collapse.)

One debate was over what photo should greet visitors to the museum. It was resolved after Tetsunobu Fujii, the son of a survivor, saw a website photo of a young girl, her hand bandaged, her face bloodied and bruised. He believed it was his mother, Yukiko Fujii. The museum confirmed it was her, at age 10. The committee unanimously chose the photo for the exhibit's entrance. Her photo at age 20 is at the exit. (She would die at 42.) They are iconic images, impossible to forget.

FOR MANY who survived the blast, survivor's guilt and psychological scars endured. Emiko

Okada, 82, wears a crane medallion around her neck, symbolizing hope and peace. She was eight when the bomb fell. That morning her 12-year-old sister, Mieko Nakasako, announced she was going out. She was headed to within half a mile of ground zero. I ask Okada whether her sister died in the blast.

"My elder sister is missing," she says.

"Missing?" I repeat, wondering what that means after 75 years.

"She has not returned home yet." There is something eerie about the word "yet," as if Okada half-expects Nakasako to suddenly appear at the door. That lack of resolution haunts Okada.

Okada was not orphaned, but she may as well have been. Her parents desperately searched for their oldest daughter, abandoning Okada, who found herself living on the streets, sleeping in an air-raid shelter, eating what she could find or steal—a discarded tomato, a fallen fig. Only later did her grandmother take her in.

"My parents lost their minds after the loss of their daughter," Okada says. When her mother was cremated, she adds, pieces of glass that had flown like projectiles that August day reappeared among her ashes and bone fragments.

For Okada and others, the horrors replay themselves even today. Okada hates evening glows, "like the sunset when the sky is orange or when the sky is really red, because that reminds me of the night of August 6."

In Hiroshima the young come to terms with the city's past in their own ways. Kanade Nakahara, 18, studied the bombing in school and in March 2019 went to Pearl Harbor on a field trip. She is determined to work for peace.

Others can't relate to that distant period. Near the Bank of Japan, which survived the blast but was where 42 people were killed, I find 17-year-old Kenta, an avid computer gamer. He regards that day as "ancient history" and isn't sure what year the bomb fell. He guesses 1964.

On the other hand, Haruna Kikuno, 18, shudders at the sound of passing planes—the result, she says, of reading books about the bomb as a child.

ON THE FLIGHT from Hiroshima to Tokyo, I introduce myself to the Hiyama family. Theirs too is the story of Hiroshima and its implausible history. The father, 44-year-old Akihiro Hiyama—"Aki"—grew up in Hiroshima, in a family of prominent political figures. His grandfather Sodeshirou Hiyama is honored with a statue for his contributions to Hiroshima's rebirth.

Hiyama's maternal grandmother, Keiko Ochia, told him that a friend of hers had planned to travel the day Hiroshima was bombed, but fell ill. Rather than see her train ticket go to waste, she gave it to Ochia. Soon after the train departed, Ochia looked out the window and saw the mushroom cloud. Her friend did not survive.

Today Ochia is 91. She married and had a daughter and grandchildren. Grandson Hiyama now lives in the U.S.—in Norfolk, Virginia. There, in 2005, he met Leah Shimer. They married and have two children: son Kai, seven, and daughter Emi, five, who hugs her stuffed unicorn.

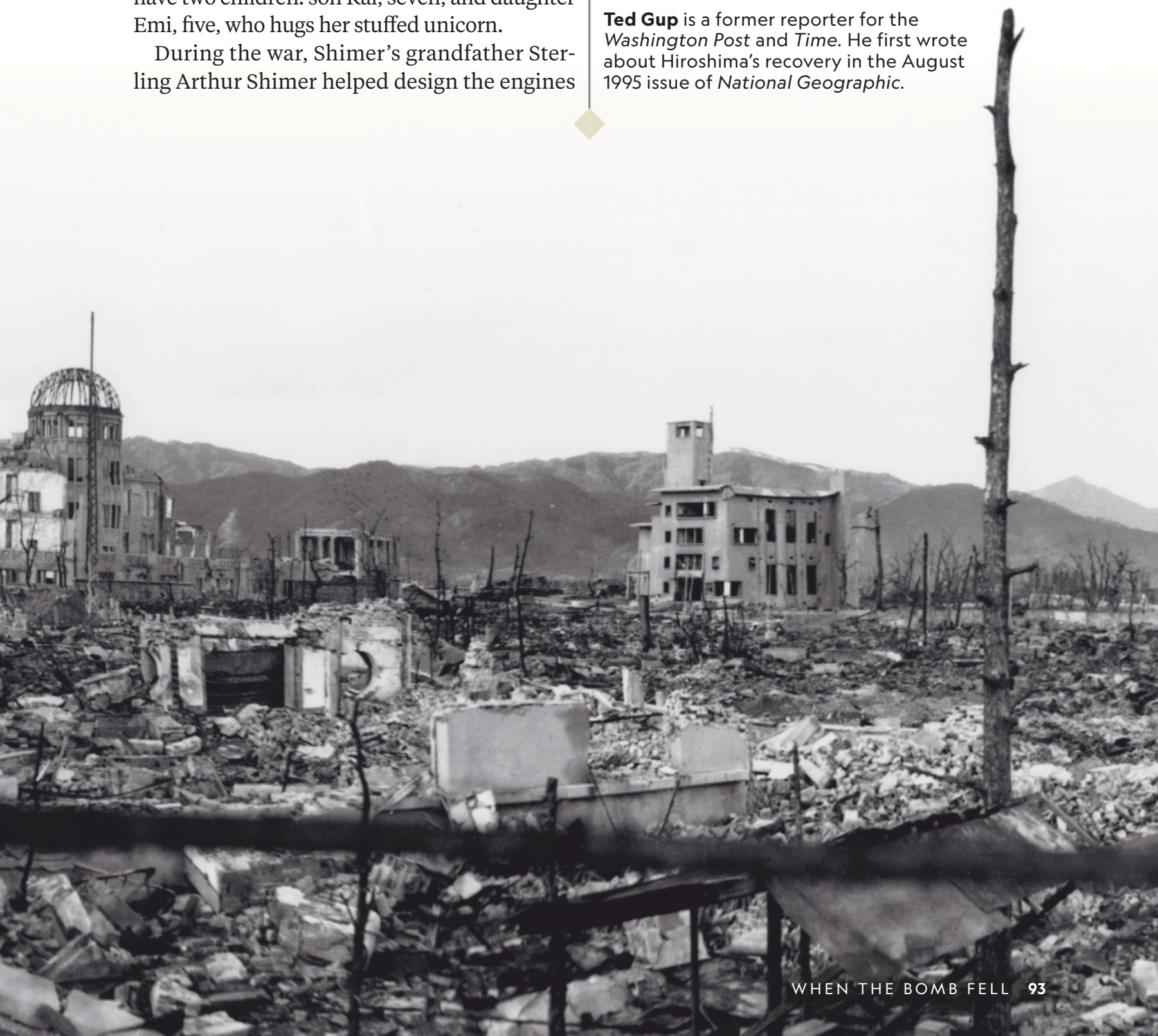
During the war, Shimer's grandfather Sterling Arthur Shimer helped design the engines of the B-29 Superfortress bombers. It was B-29s that rained tens of thousands of tons of explosives down on Japan, as well as incendiary bombs, and ultimately, the atomic bomb that decimated Hiroshima.

Between flights, Hiyama, Shimer, and I speak of those war years. Kai listens, trying to make sense of it all. "Mama," he asks, "what's a mushroom clown?" It falls to Shimer to answer. "Dust and debris went up into the sky when the bomb went off," she tells him. "It was something really sad. A lot of people died."

"They are sweet, innocent ears," she says later. "I am glad I can be the one to introduce some of this to him." But Kai has one more question: "Are America and Japan still enemies?"

"No," his mother says, "they are friends." And with that, the family heads for its gate and the long flight home. ▯

Ted Gup is a former reporter for the *Washington Post* and *Time*. He first wrote about Hiroshima's recovery in the August 1995 issue of *National Geographic*.



IF WARMING CONTINUES

TO MELT THE ICE SHELVES

THAT ARE CRUCIAL TO THEIR SURVIVAL,

EMPEROR PENGUINS WILL BE ...

MARCHING TOWARD

BY HELEN SCALES

PHOTOGRAPHS BY
STEFAN CHRISTMANN

EXTINCTION

Male emperor penguins at the Atka Bay colony, each with an egg balanced on his feet, huddle to endure the two-month polar night. Females, after mating and laying the eggs, have returned to the sea to feed. Huddling is so tight that the birds can steam when they break apart, as if they'd stepped out of a sauna.

PREVIOUS PHOTO

In the autumn the penguins begin their roughly six-mile journey from the ocean to their Atka Bay breeding grounds. But the warming climate is defrosting the sea ice they need to find mates, breed, and raise chicks.

Before departing for the sea, a female assists her partner in transferring her egg onto his feet. The delicate routine must be quick or the egg might freeze. Though she'll be gone for about two months, the couple's bonds stay strong, and they will reunite in August.

FIRST, A BLACK DOT APPEARS IN THE DISTANCE. MORE DOTS JOIN, FORMING MEANDERING LINES ACROSS THE NEWLY WHITE ICESCAPE.

“Then all of a sudden, you hear the first calls,” photographer Stefan Christmann says. That’s when it really hits him: “Wow. The birds are coming back.”

It’s late March in Atka Bay, in Antarctica’s Queen Maud Land, nearly 2,700 miles southwest of the southern tip of Africa. Christmann has been waiting more than two months for the emperor penguins—the biggest of all penguins, standing about four feet tall and weighing up to nearly 90 pounds—to return from foraging at sea.

His plan is to stay with the Atka Bay colony’s roughly 10,000 penguins through the winter, for the second time. He spent the winter here five years ago and has come back to complete his chronicling of the emperor’s breeding cycle—something few, if any, wildlife photographers have done. With temperatures falling to at least 50 degrees below zero Fahrenheit (45 degrees below zero Celsius) and shrieking blizzards that cut visibility to a few feet, the Antarctic winter is not for the faint of heart—especially during July and August, its coldest months.

“To be quite honest, you get used to it after

In late July, tiny claws, an eye, and a clump of damp feathers become visible as a chick begins to break through its shell, a process that can take hours. All the while, the father repeatedly peeks under his feathered brood pouch to monitor progress.

a while," Christmann tells me matter-of-factly.

What the emperor penguins won't easily get used to is diminishing—and possibly disappearing—sea ice, which provides a stable breeding platform and base from which they can hunt for food in surrounding waters. Despite being superb swimmers, adult emperors in the 54 colonies around Antarctica—some 256,500 breeding pairs—must nurture their chicks out of water on the sea ice before spring comes and the ice melts. Antarctic sea ice is highly variable, but five years ago it suddenly declined, with record shrinkage in 2017, according to a study published last year in the *Proceedings of the National Academy of Sciences of the United States*. Sea ice may now be recovering, but it still remains below the long-term average, and climate models predict continued significant losses by century's end unless urgent action is taken against climate change.

"Under a business-as-usual scenario, emperor penguins are marching towards extinction," says Stéphanie Jenouvrier, a seabird biologist at Woods Hole Oceanographic Institution in Massachusetts. Her team's research indicates that if carbon emissions remain unchecked, 80 percent of the emperor colonies could be gone by 2100, leaving little hope for the species' survival. Average global temperature is on track to increase by three to five degrees Celsius (5.4 to nine degrees Fahrenheit) by then, but if the rise can be kept below 1.5 degrees Celsius (2.7 degrees Fahrenheit), Jenouvrier says, perhaps nearly 20 percent of colonies would be lost, while the Ross Sea and Weddell Sea populations, potential emperor penguin refuges because of more favorable sea ice conditions, would increase slightly.

Chicks tussle while keeping warm on their parents' feet. After the mothers return to the breeding grounds, they share babysitting duties with their partner so the birds can take turns feeding on fish. Parents that stay behind often stand together, allowing chicks to interact.

A spring blizzard sweeps in as the chicks begin exploring the ice with newfound independence. In two months the fledglings will grow waterproof feathers and swim off. Five years later they'll return to rear their offspring—if the waters of Atka Bay continue to freeze in winter.

WITH THE SEA ICE PLATFORM in place and the Atka Bay penguins settled in, Christmann sets about capturing the scene as they begin a brand-new turn of their life cycle. An elegant courtship unfolds as penguins pick that year's partner. A brief and awkward copulation follows, as the males do their best not to fall off.

Afterward, the penguin partners stick together, mirroring each other's movements. Their close bonds will help ensure their chick's survival—it's the only one they'll have that season. One day Christmann notices a pair peering at a snowball carefully balanced on the female's feet. He guesses they're a first-time couple practicing their egg-balancing skills.

By the end of May, the first eggs appear, one per female. Laying has come at a physical cost, so the hungry female carefully passes her egg to her mate and gets ready to leave. The partners will test the strength of their bonds as the females return to sea to feed.

For the males left behind, winter closes in. In 100-mile-an-hour winds and plummeting temperatures, the birds huddle to share body heat. Such cooperation keeps the dads and their precious eggs alive, as do the males' body reserves—there's nothing to eat, and they'll lose almost half their weight before the females return. On the coldest days the penguins fall silent, saving as much energy as possible. All Christmann hears is the eerie sound of their feet scraping over the ice.

Through the six-month-long winter, Christmann and 11 others are the only humans in this part of Antarctica, huddling themselves in a small German research station perched on the ice shelf above Atka Bay. In all but the worst of storms, when the humans stay inside, it's a snowmobile ride down the steep escarpment and onto the sea ice to be with the penguins.

In late July the polar night ends, and soon the rising sun greets new voices in the colony. If their mothers don't get back in time with food for their young, the chicks get their first meal from their father—gooey milk from his esophagus. But after enduring the winter, not all the males have been successful. Christmann sees one picking up a dead, frozen chick and balancing it on his feet. "He took the chick and walked towards the colony, acting as if everything was normal." It was "heartbreaking," Christmann says.

Females return just when their starving partners need them most. Pairs reinforce their bonds. Mothers see their chicks for the first time and take over feeding duties. For months, parents form a tag team, taking turns to fetch food for the growing chicks. Around September, both parents must go fishing together to satisfy ever hungrier mouths, leaving the chicks to hang out in crèches.

The youngsters learn to huddle, not always neatly. A few nestle together, then others race up and slam into the pile. As the huddle grows, latecomers try pushing in—"right in the warm portion of the huddle," Christmann says.

Sometimes lone parents stay behind and watch over the crèches. Christmann sees an adult with two chicks. Although only one belongs to the caretaker, the bird reaches down and feeds them both. An accident? Maybe not. Adult emperors frequently perform a ritual of lifting their brood pouch, a feathery flap of skin, to show others their newborn. It's unproven, but Christmann thinks it's possible that the parents do this to form close bonds, becoming guardians to each other's chicks and helping out with childcare.

Toward year's end, the chicks are nearly as tall as their parents, but they aren't out of danger. Before the sea ice melts, the chicks must swap their gray down for waterproof, adult feathers; otherwise, they'll drown. This happened in 2016 at the Halley colony, when a storm broke up the ice before October and the chicks were still in their crèche period. Since then the ice hasn't been stable enough to support adults, leading to almost complete breeding failure, with no chicks successfully reared. That colony—previously Antarctica's second largest—is now mostly abandoned. The storm coincided with the strongest El Niño event in 60 years, the kind of extreme weather pattern that's expected to become more frequent. Counts of penguins in satellite images are under way to gauge how much the birds have been affected by the recent changes in sea ice losses around Antarctica. The results likely will be a warning sign for the future of the species.

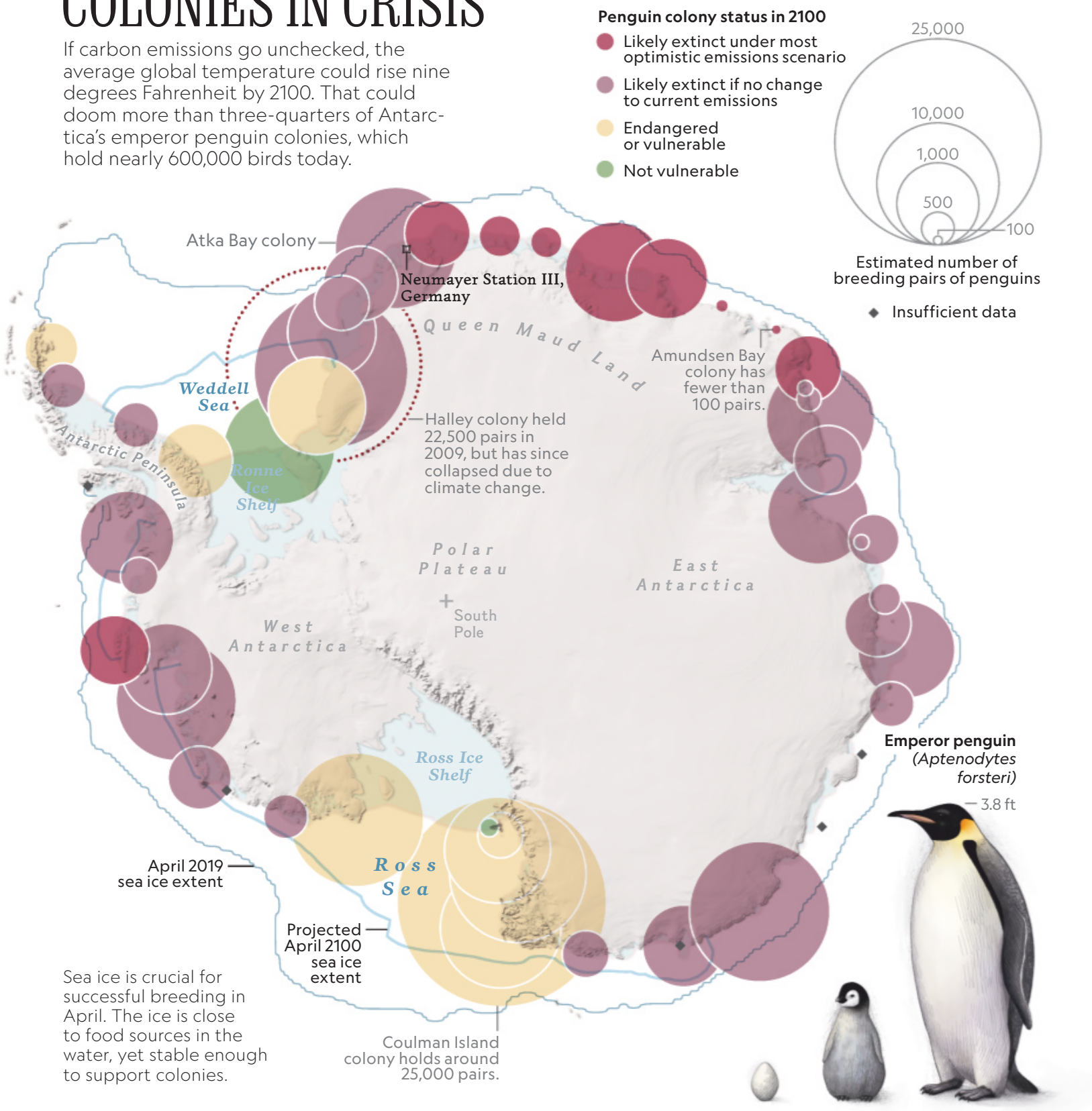
BACK IN ATKA BAY, the sea ice begins melting at the end of December, earlier than expected, and Christmann sees molting adults and chicks clambering to safety atop the higher ice shelf—an extension of the much thicker terrestrial ice—using a pile of drifted snow as a ramp.

A month later, he watches the last full-grown chicks leap from the shelf some 15 to 30 feet into the sea. "It looks spectacular," he says.

Elsewhere in Antarctica, emperor penguin colonies won't have this option to survive the

COLONIES IN CRISIS

If carbon emissions go unchecked, the average global temperature could rise nine degrees Fahrenheit by 2100. That could doom more than three-quarters of Antarctica's emperor penguin colonies, which hold nearly 600,000 birds today.



CHRISTINE FELLENZ, TAYLOR MAGGIACOMO, AND TED SICKLEY, NGM STAFF. SOURCES: PHILIP N. TRATHAN AND PETER T. FRETWELL, BRITISH ANTARCTIC SURVEY; MARIKA HOLLAND, NATIONAL CENTER FOR ATMOSPHERIC RESEARCH; STÉPHANIE JENOUVRIER, WOODS HOLE OCEANOGRAPHIC INSTITUTION; PABLO GARCIA BORBOROGLU, GLOBAL PENGUIN SOCIETY

early disintegration of their sea ice haven. Many ice shelves are simply too high for waddling penguins to climb. Even if they make it up, the ice is scarred with deadly crevasses, and there's no shelter from the punishing winds. "I'm worried about them becoming the new polar bears," Christmann says, referencing those famous denizens of fast-shrinking Arctic sea ice.

It was never going to be easy for Christmann, spending a year on the frozen continent, leaving his loved ones behind, but the emperor penguins kept him going. "There's this bird that cannot fly, that walks funny, that always looks grumpy, and this bird shows you how it's done," he says. "They are able to live through the harshest of conditions, and it would be us who send them over the edge. I would feel very, very sad about that." □

Helen Scales divides her time between Cambridge, England, and the French coast. She's written five books about the oceans. **Stefan Christmann** won the 2019 Wildlife Photographer Portfolio of the Year Award for his work on emperor penguins.

WOMEN IN BOLIVIA, NEW ZEALAND, IRAQ, AND AFGHANISTAN HAVE MADE HUGE **GAINS** IN ACHIEVING **POLITICAL POWER.** BUT MANY STILL **FACE CULTURAL RESISTANCE—** AND EVEN **VIOLENCE—**AS THEIR INFLUENCE INCREASES.

TAKING THE

BY **RANIA ABOUZEID** | PHOTOGRAPHS BY **ANDREA BRUCE**

LEAD

LEFT

Afghanistan

Latifa Muhsini, 35, is the deputy governor of Bamyan Province. Women now hold the position in five of Afghanistan's 34 provinces. Here, Muhsini, who pledges to protect her province's environment, enjoys her weekly hike in Band-e-Amir, Afghanistan's first national park, with her husband (by her side) and their friend.

PREVIOUS PHOTO

New Zealand

Bronwyn Clifford, 16, stands with other Maori women on Waitangi Day, observed each February to commemorate the Treaty of Waitangi, signed by some 500 Maori chiefs and the British in 1840. Much ancestral land was lost during Britain's 19th-century colonization. Today Maori women use social media to mobilize support for indigenous land rights and other reforms.

NEXT PHOTO

Bolivia

Shortly after she was elected in 2015 as the first woman mayor of El Alto, Soledad Chapetón Tancara, center, received threats, and an arson attack on her office killed six people. Chapetón, who campaigned against graft and cronyism, is "proud to have achieved a lot, despite few economic resources." Here, surrounded by supporters and draped in elaborate garlands given to her, she attends a dedication ceremony.

The Bolivian mayor thought she was going to die.

Bolivia

Mayor María Patricia Arce Guzmán, 48, of Vinto, was attacked during violent protests after the 2019 election. She believes she was targeted because she's a woman and she supports female empowerment programs.

It was November 6, 2019, and the municipal building was on fire, set ablaze after a disputed October presidential election and protests that ousted socialist president Evo Morales. Mayor María Patricia Arce Guzmán, 48, a member of Morales's party, the Movement Toward Socialism (MAS), escaped the smoke and tried to dodge the hostile crowd outside.

Hobbled by a bad knee, she ran through the streets of Vinto, a town in the central Bolivian department of Cochabamba where she'd been mayor since June 2015. She lost her shoes but didn't stop. "Then they grabbed me and started shouting that I was a murderer," Arce later told me. And her hours-long ordeal began.

Rioters doused her in gasoline. She also

smelled of urine and bleach. Kicked, beaten with sticks, and pelted with stones, the mayor was dragged barefoot to a site where a 20-year-old man, Limberth Guzmán Vásquez, had died in clashes between left-wing supporters of the ousted president and their right-wing opponents. The anti-Morales protesters accused Arce of financing and supporting leftists involved in the violence that claimed the young man. "I thought they were going to kill me, set me on fire," Arce says.

A man poured red paint over her. A woman cut off Arce's waist-length, honey-colored hair. "It felt like she was almost tearing my scalp." Some in the crowd shouted that they would kill her two sons. Others told her to resign and to denounce former president Morales, who had been declared the winner of the election, amid allegations of fraud. After losing support from the military and police, Morales resigned.

Videos circulated on social media of a distressed but defiant Arce surrounded by masked protesters. "I'm not going to shut up!" she said in one snippet. "And if they want to kill me, let them kill me!" Finally, people she didn't know spirited her away on a motorbike and handed her to the police for protection.

The assault on Arce reflected the depth of bitter divisions in Bolivian politics. But it also shed light on a contradiction: Bolivia is known for promoting representation by women in its national and local governments—and it's one of

Bolivia

ABOVE

Most of the files teetering on packed shelves at the medical examiner's office in El Alto are for recent domestic abuse cases. Women report incidents at the office, lining up outside on Monday mornings, after their partners have returned to work.

RIGHT

Family members of femicide victims—women killed because of their gender—protest before the Presidential Palace in La Paz in January 2020. On this day, interim president Jeanine Áñez Chávez called for modifying a law that favors aggressors in cases of violence against women.

18+

WHAT IS AVAXHOME?

AVAXHOME-

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the most dangerous places in South America to be a woman. The country has the highest rate of femicide, women killed because of their gender, on the continent—2.3 murders for every 100,000 women in 2018. In 2019, 117 women were killed. It's estimated that 70 percent of Bolivian women have been sexually or physically abused.

That's why Arce and many other women in Bolivian politics say the attack stemmed in part from a culture of machismo—a resentful version of the pervasive bias that challenges women leaders around the world, including in places like Bolivia, where a 2010 law requires that women make up at least half of all party nominees for federal, state, and local offices. Women now hold 53 percent of the seats in the national legislature.

When Arce was assaulted, there were three other women mayors in Cochabamba, also members of Morales's party. Only Arce was targeted physically. She suspects it's because of the female empowerment programs she championed: skills-based employment training such as basket-weaving and cooking classes, aimed at promoting financial independence for women. The programs weren't popular with some men, she says.

Arce's detractors accuse her of improperly using public resources to incite violence, which she denies. "There is a lot of machismo here," Arce says. "I think they wanted to teach me a lesson and make me an example to others."

Arce returned to her office in Cochabamba weeks after she was attacked to finish a term that would end on May 30, 2020. On a warm December morning she sat at her desk, her natural dark brown hair growing back, slightly longer than a buzz cut. "The fear is always there," she told me. "I don't feel protected here."

The glassless windows in her office, smashed in the riot, were still covered in plastic sheets that billowed gently. Images of Morales adorned the walls. There were no photos of Morales's more conservative successor, Jeanine Áñez Chávez—a woman—whom Arce does not support. "We women have struggled to have a [political] space and we can't give it up," Arce said through tears, referring to her mayoral post. "If I quit and let them win, what message does that send to the people, to the women I tell to keep going?"

THROUGHOUT HISTORY and around the world, women who sought political power often faced resistance, ranging from slurs to assassination. Women have made significant gains but continue to face familiar barriers, including in countries that have given women a greater voice in governing. In more than half the world's countries, including Bolivia and conflict-riddled states such as Afghanistan and Iraq, legislative gender quotas now guarantee the formal political participation of women. Such quotas have their limitations, however. They've been criticized as undemocratic and discriminatory by some in liberal democracies who argue that they undermine the principle of merit by favoring women over men solely based on gender. And, as in Bolivia, they don't prevent criticism of women officials from occasionally taking on a nasty, sexist tone.

There also are historical structural inequalities embedded in gender-neutral, merit-based political systems. These nonquota systems,

Bolivia

Judith Yolanda Quintana Vega (at left) prays with her sister, Estela, where the body of her daughter, Abigail Quintana, 18, was found. The sisters have formed a group to advocate for justice on behalf of victims of femicide.

New Zealand

RIGHT

From left, Maori wardens Huhana Tukaki, Wiki Todd, and Maryann Vogt enjoy a moment at the 2020 Waitangi Day. Some 900 volunteer wardens help ensure the health and safety of indigenous communities.

BELOW

Kiritapu Allan, a member of parliament, attends the Mataatua Kapa Haka, a performing arts competition, with her daughter, Hiwaiterangi Allan-Coates. Allan says her priority is advocating for those in remote and rural communities and others who often do not have a voice.

such as in the United States, can favor the dominant groups in society, including men, white people, and those with significant financial resources. Overcoming barriers to political entry is one challenge. What women can—and can't—do once in power is another. The inclusion of women in a party or parliament may tick the box for gender equality, but it also can be tokenism if female politicians are seen but less often heard. And then there are questions of which women gain access to the halls of power and how representative they are of others—questions that several countries, such as New Zealand and Afghanistan, are grappling with. Despite intimidation, violence, and other barriers, women around the world are holding their ground in an effort to seize and strengthen their political power.

SOME GOVERNMENTS have made significant advances in female participation in politics without mandating quotas.

New Zealand, the first country in the world to grant women the right to vote, in 1893, ranks 20th in the world when it comes to women's inclusion in parliament. The United States, by comparison, sits at number 81, according to the Inter-Parliamentary Union, a Swiss-based global organization of parliaments. But getting in is only part of the challenge. In some countries, the presence of women in decision-making roles doesn't necessarily translate into greater equality for that country's women. For some women, such as Iraqi parliamentarians, being in power doesn't always mean having power.

Iraq was once at the forefront of women's rights in the Middle East. The country's 1959 Personal Status Law restricted polygamy and child marriage, outlawed forced marriages, and improved women's rights in divorce, child custody, and inheritance. The 1970 constitution, drafted by Saddam Hussein's secular Baath Party, enshrined equal rights for all citizens. Women's literacy rates, education, and participation in the workforce were all actively promoted through generous policies such as free childcare and six months of paid maternity leave.

That momentum was reversed by international sanctions and decades of successive wars. Hussein was a brutal, murderous dictator, but his fall in 2003 paved the way for the rise of conservative religious clerics and parliamentarians who have sought to chip away at women's rights. The religious political parties "really don't believe in women participating in high positions," says Hanaa Edwar, who's been working on human rights for more than 50 years.

The post-2003 Iraqi Constitution decrees that a quarter of the nation's parliamentary seats are reserved for women, but as women everywhere know, being in the room doesn't necessarily mean being heard. Noora al-Bajjari, a female parliamentarian from Mosul first elected in 2010, says that the religious parties and blocs that dominate parliament "consider women are simply there to make up the numbers and not to have an actual role in major decision-making."

There are no women in Iraq's cabinet or other high-level roles, and al-Bajjari says that Iraq's female parliamentarians are not allies. "I must be honest. We women don't support each other or ourselves. There's an element of jealousy, selfishness, competition."

If Iraq's 84 female lawmakers banded together, they'd form a significant bloc in the 329-seat

New Zealand

Prime Minister Jacinda Ardern speaks to the New Zealand Parliament in February. Amid the COVID-19 crisis in March, she was decisive in announcing a strict lockdown for the nation. “I have a very keen sense of the magnitude of this moment,” she said. “Kiwis, go home. Be strong and be kind.”

parliament, Edwar says. Until 2018, attempts to form a female caucus in the house had failed. Edwar is co-founder of several groups, including Al-Amal Association and the Iraqi Women's Network, an umbrella group encompassing more than 90 women's organizations. Edwar is trying to change attitudes in parliament through workshops for male and female lawmakers focused on political empowerment and women's issues.

"We are not making confrontations; we try to make a channel of cooperation, even with the ones who are against the points we raise," she says.

And she is seeing results: "Some of them were religious people—they changed their ideas," she adds. "But the problem isn't just creating change, it's the high voices of those opposed to change. They are a very small group, but they are very aggressive and … they try to drown the voices of others."

She's talking about people such as the conservative parliamentarians who in 2014 backed a bill known as the Jaafari law. Included among its 254 articles was a provision to legalize marriage for girls as young as nine years old, while another stated that a husband was not required to financially support his wife if she was either too young or too old to satisfy him sexually. Women's rights activists were the driving force of opposition to the bill and succeeded in removing it from the parliamentary agenda as well as defeating a subsequent attempt, most recently in 2017, to introduce similar legislation.

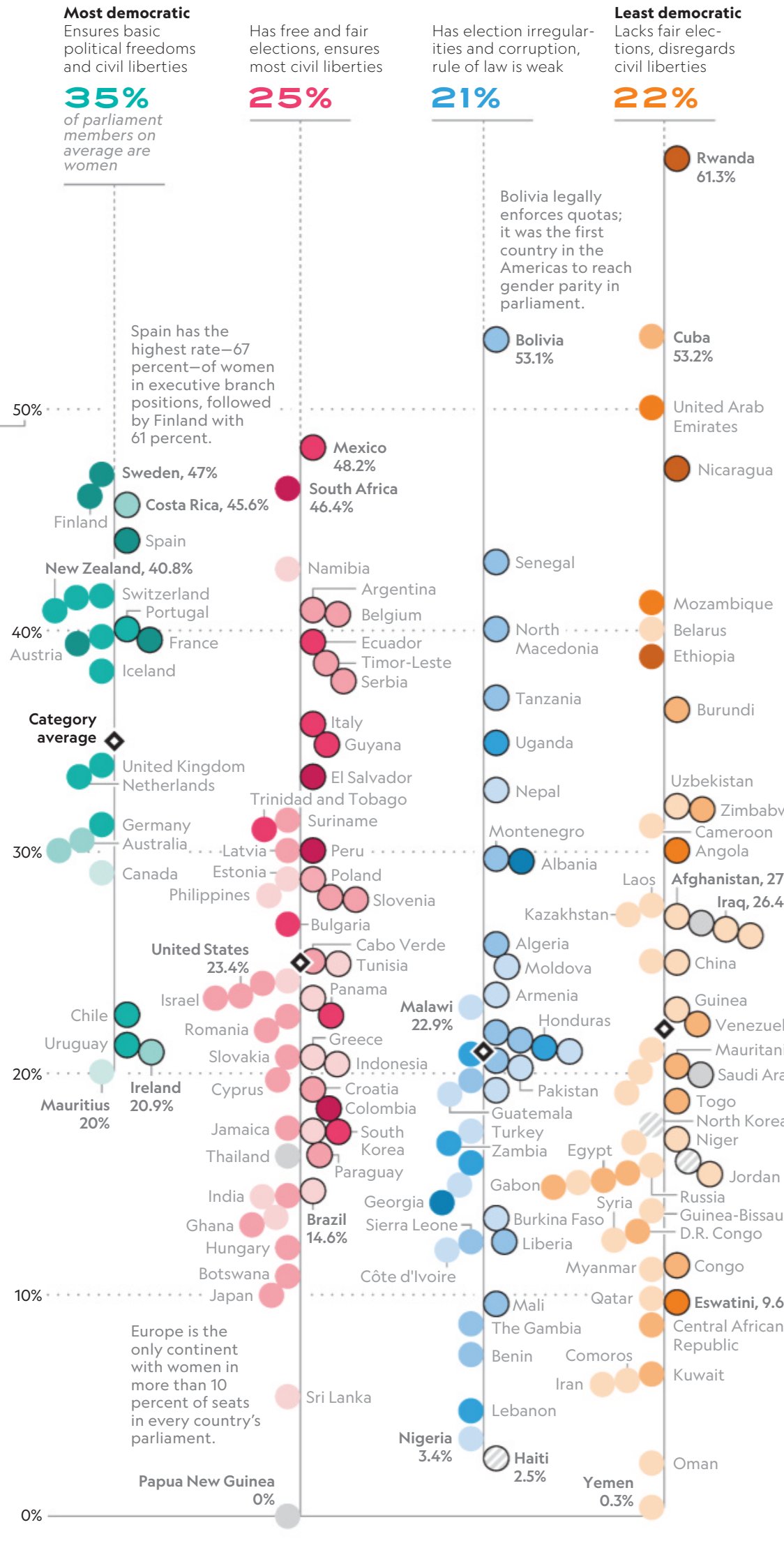
"We raised public opinion against it," Edwar says. "I was so, so happy to see that not only our voices but … the voices of public opinion in Iraq were raised very strongly against this. That was the happiest moment."

AFGHANISTAN'S WOMEN, like Iraq's, have faced decades of war, foreign military interventions, the rise and fall and rise again of hard-line Islamists such as the Taliban, and worsening political instability and insecurity. But unlike Iraq's female parliamentarians, who were late to form a women's assembly, some in Afghanistan established a women's caucus more than a decade ago. Twenty-seven percent, or 68 of the 249 seats in Afghanistan's lower house, are reserved for women.

Changing the Face of Politics

A global picture of current female representation in government shows that the strongest democracies have the highest average percentage of women in their parliaments.

The state of democracy in each country is classified by the Democracy Index, based on performance in the following categories: electoral process and pluralism, governance, political participation, political culture, and civil liberties.



WOMEN IN NATIONAL LEGISLATURES

Social and economic barriers persist, but the Inter-Parliamentary Union reports that women held 24.9 percent of global parliamentary seats in 2020, up from 11.3 percent in 1995.

GENDER QUOTAS

Some quota laws specify that a certain percentage of candidates must be women; others reserve a number of elected seats.

Country with no quotas

Country with legislated quotas

Not all countries are labeled.

TOP SPOTS

Women fill only 22 percent of the highest decision-making positions in the executive branch, which leads key policy areas of governmental action.

Percent of women in ministerial positions

- Over 45%
- 30-45
- 15-30
- 1-15
- 0
- No data

WOMEN'S REPRESENTATION DATA AS OF JANUARY 1, 2020, FOR 162 COUNTRIES; DEMOCRACY INDEX DATA AS OF 2019

IN BICAMERAL PARLIAMENTS, ONLY LOWER HOUSE DATA ARE MEASURED.

NGM ART, LAWSON PARKER. SOURCES: INTER-PARLIAMENTARY UNION; INTERNATIONAL INSTITUTE FOR DEMOCRACY AND ELECTORAL ASSISTANCE; THE ECONOMIST INTELLIGENCE UNIT DEMOCRACY INDEX

Shinkai Karokhail was first elected to parliament in 2005 to represent the capital, Kabul. She was instrumental in assembling the female caucus, spurred by a draft bill known as the Shiite Personal Status Law. It was similar in content to Iraq's Jaafari bill, and both bills were based on the same religious jurisprudence. "It was terrible stuff," Karokhail says of the bill's articles.

"The problem was that the main decision-makers in this society are men, not women; even if we become politicians, the first and last word is said by a man," says Karokhail, who received death threats for arguing against the bill. "I was under a lot of pressure. I limited my movements and had guards look after me. It was a terrible time."

Female parliamentarians make up only two dozen of the 150 or so members of the women's parliamentary caucus, which includes women from civil society, the judiciary, and the media. "The most important thing was that we stuck together and said, What's our priority?" Karokhail says. "If you are in the parliament and you came via a reserved seat, the quota system, that comes with obligations and we have to fulfill them. We have to work for the women of Afghanistan."

Amendments were made to the bill, and despite continued protests by women's activists, it was signed into law in 2009, the same year as the Elimination of Violence Against Women Law, championed by the women's caucus.

Afghanistan's women now face a new yet familiar challenge—the return of the Taliban and its repressive attitudes toward women. In 2001, the Taliban government was ousted in a U.S.-led invasion following 9/11 as punishment for the group's harboring of al Qaeda leader Osama bin Laden in Afghanistan. In February 2020, the United States signed a peace deal with the Taliban aimed at ending the 18-year war. It's unclear how much influence the Taliban still holds inside the war-torn nation and how it intends to wield it after U.S. troops withdraw.

"We don't know yet really what the Taliban wants us to lose and to sacrifice," Karokhail says, noting that Afghan women weren't involved in the U.S.-Taliban peace talks. "Women were always the losers of the war, and we don't want to be the losers in the peace agreement. That's our concern. We are not against peace, we are not against bringing the Taliban back to [politics in] Afghanistan to at last end this long war." But the "women of today are not the women of yesterday." Women, she says, deserved seats at the negotiating table.

Jamila Afghani, a prominent women's rights activist and Islamic scholar, was one of the few women granted an audience with the Taliban. She was among the delegation of women to meet with Taliban officials involved in the peace talks last summer in the Qatari capital, Doha. The 11 women were part of a larger group of Afghan civil activists.

Afghanistan's women face a new challenge. They fear losing rights they secured after the hard-line Taliban government's fall in 2001.

"Unfortunately, during the formal meetings there was no opportunity to talk" about women's rights, but "we raised this question during the tea breaks, lunch breaks, with them," she says.

Afghani came away from the two-day meeting concerned. "The Taliban said that they will agree with sharia-given rights and regulations for women," or more precisely, their interpretation of such rights, which Afghani considers "totally unacceptable and un-Islamic" because of the limits placed on women. "We cannot go back to what it was like before, under Taliban rule," she says. "They were banning women from going to school and work. We cannot tolerate that."

Since the Taliban was ousted from government in 2001, Afghani has worked to empower women through Islam, educating some 6,000 imams across the country about women's rights through her Noor Educational and Capacity Development Organization. She also has provided literacy and religious education to about 50,000 girls and women. She says she has been

Afghanistan

RIGHT

Parliamentarian Maryam Sama, 28, a prominent member in the women's caucus, leaves parliament on December 9, 2019, the day that the body narrowly passed a law protecting children's rights. "We are the women who grew up after the war, we are the new generation, we have demands," she said.

BELOW

Zarifa Ghafari, 28, is one of very few female mayors in Afghanistan. She governs in Wardak Province, a Taliban stronghold. To stay safe, she spends nights in Kabul. Even there is risky: In March she was attacked by gunmen but was not injured.

threatened by the Taliban "many, many times," and that in the past two years, eight of the imams in her network have been assassinated for teaching a version of Islam that does not gel with the Taliban's. She wants other women activists "who have the knowledge of Islam" to work together to present interpretations of sharia that are alternatives to the Taliban's version.

But Karokhail says that Afghani and her ideas don't represent her. Afghani has "a different mentality" than most Afghan women, Karokhail says, adding that while it was important to have women at peace talks with the Taliban, "which women are you talking about? ... You can't have a few political elite ... and say, there—women are represented."

Afghani's heard such criticism before. "Sometimes I feel like, where should I go? Civil society is moderate; civil society thinks I'm conservative or I'm Islamist, and some of the Islamist people say I'm introducing a new Islam," she says. "I cannot represent everybody, but I'm sure that I can represent a large number of women who believe in Islamic values."

IT'S A QUESTION that even peaceful, historically progressive Western democracies such as New Zealand's have grappled with: Which women are being heard, from what communities, and for whom are they speaking? New Zealand's current leader, 39-year-old Jacinda Ardern, is the country's third female prime minister, after Jennifer Shipley blazed a path in 1997, followed by Helen Clark two years later. New Zealand has never elected a prime minister, male or female, from its indigenous Maori population, which makes up about 16.5 percent of New Zealand's nearly five million people. There have been Maori members of parliament since 1868, after the Maori Representation Act of 1867 designated four elected Maori seats in the 120-member House of Representatives, which includes 71 elected seats and 49 appointed by parties. Now, more than 150 years later, there are seven elected Maori seats and 29 Maori in the house overall, 11 of whom are women.

New Zealand's Maori secured their rights by fighting the British colonizers to an agreement, the 1840 Treaty of Waitangi, the founding document of the state. There are hundreds of outstanding claims by Maori for breaches of the deal. The treaty was declared null in 1877 by Sir James Prendergast, New Zealand's chief justice. He said it had been signed "between a civilised nation and a group of savages" who were not capable of signing a treaty. It wasn't legally recognized again until the 1970s.

Before colonization, Maori women "shared an equal but complementary power with men," says Margaret Mutu, professor of Maori studies at the University of Auckland, the chair of her indigenous Iwi parliament, and a tribal leader of her Ngati Kahu people. Women, she says, were responsible for the spiritual well-being of their people while men dealt with the physical world.

"In terms of decision-making and the exercising of power, women were an essential part of it," she says, adding that the Western patriarchal traditions of the colonizers, specifically Christianity, "did huge damage to that system."

In the late 1800s Maori women, most notably Meri Te Tai Mangakāhia, campaigned for woman suffrage and the right to stand for parliament. "Maori women never assumed that they had no role or had no voice, as white women just assumed it," Mutu says.

بسم الله الرحمن الرحيم

★ بسم الله الرحمن الرحيم ★

وَإِذَا سَأَلَكَ عِبَادِي عَنِّي فَإِنِّي

قَرِيبٌ أُجِيبُ

وَقُولُوا لِلنَّاسِ حُسْنًا

المحسن

Afghanistan

End-of-term exams are over at Kabul's Zarghona High School, one of the country's largest girls' schools, with more than 8,500 students and 230 teachers. "We are scared," Principal Nasreen Noorzai says, concerned the Taliban could regain power and deny education to girls.

In many ways Maori culture has been mainstreamed, although assimilation can also be a form of colonialism. Maori greetings such as *kia ora* are widely used by non-Maori, and schoolboys are taught how to perform the haka war dance. Despite the semblance of integration, communal relations between some Maori and non-Maori are fraught, with pending land-rights disputes and allegations that the state has been biased against Maori women.

Kiritapu Allan, 36, was appointed by her Labour Party and is one of the 29 Maori in the 120-seat house. She remembers hitchhiking through Wellington at age 17 on the way to catch a ferry to the cherry-picking fields. Allan recalls looking at the parliament building known as the Beehive and wondering about the disconnect "from those halls or chambers of power," she says. "How do these people here represent me, and do they understand people like us?"

Allan went back to school to study law and politics. She joined Ardern's Labour Party while in college and interned in the office of then prime minister Helen Clark. As a young Maori woman from a modest, blue-collar background and a married mother in a same-sex relationship, Allan says she made it to parliament in 2017 with a lot of luck and hard work, and not because of any structural ladders that helped her rise. "Whether you're young and indigenous, young and ethnic, young and a woman, if you live a nonprivileged existence," Allan says, "there are significant challenges that you have to overcome."

New Zealand has voluntary party quotas. In 2013, the Labour Party became the first to introduce a gender quota system to ensure that half of its parliament would be women. In 2015, the Green Party announced that half of its cabinet ministers would be women.

Prime Minister Ardern made headlines for being an unmarried pregnant woman leading a country. When Allan brought her four-month-old baby into parliament, she says, it invoked "a lot of vitriolic opposition. How dare a mother be in the parliament, parenting a child," she recalls. "If we want to encourage more and more women into not just the workforce but positions of power and leadership, well, women need to take leadership on what that looks like."

In her moving maiden speech to the house in 2017, draped in her family's heirloom Korowai cloak of kiwi feathers, Allan recounted how her grandmother and namesake was punished at school for speaking her native language, and how her name was changed from Kiritapu to Kitty.

"My nana's cultural identity was whipped out of her at that school, and so too, some might say, was her voice. So Nana, I stand here in this House to honour your name, to give voice to the voiceless, who, for whatever their circumstances, cannot speak for themselves," Allan said in her speech. It is a powerful legacy that Allan considers a key part of her mission.

Issues around the law, human rights, public authority, and the impact on indigenous communities inspired Allan's bid to become a lawyer and then a politician. "It triggered my career to really understand the law and its application, and how the law could be used as a tool not only for oppression but how it could be a tool of liberation or at least restrict oppression."

STILL, THERE IS ONLY SO MUCH the law can do. There are limits to legislating reform, especially if societal attitudes don't change, or the implementation of existing laws is lax. On paper, Bolivia's 2009 constitution guarantees equal rights for women. Legislation such as 2013's Law 348 criminalizes violence against women and imposes a penalty for femicide of 30 years in prison without parole. But conviction rates are dismal. Less than 4 percent of femicide cases result in a sentencing.

In April 2019, Shirley Franco Rodríguez, a 32-year-old parliamentarian touted as a vice presidential candidate and a senior member of the Democratic Unity party, called for a panel to investigate judicial delays in femicide and rape cases. "The main problem is that there are laws, there are rights, there are sanctions, but no mechanisms exist to enforce compliance, so everything is rhetoric; it's not real," she says.

Violence against women in politics is so pervasive that in 2012 Bolivia pioneered a law to try to combat it. Law 243 criminalizes acts including spreading false information about female politicians to discredit them or, as in the case of Mayor Arce, pressuring a woman to resign from an elected position and physically attacking her. The mayor has filed a formal complaint, but she doesn't know if she'll get justice.

In 2019 the Bolivian Association of Councilwomen, an NGO that brings together councillors

and mayors to defend the political rights of women, received 127 complaints of various forms of harassment and intimidation. In 2018 there were 117 complaints and the year before that, 64.

Bernarda Sarué Pereira, executive director of the organization, suspects the real numbers are much higher but that fear keeps women from reporting abuse. "When someone makes a formal complaint, their persecution doubles, their harassment doubles, they are bothered more and stigmatized," she says.

There are only 33 female mayors in Bolivia's 339 municipalities, 11 of whom have filed complaints. The Bolivian women who have been targeted serve at all levels of power including the parliament, and they are from across the political spectrum. The harassment is not restricted to a geographic location or women of a particular ethnicity in a country where some 48 percent of the population is of indigenous origin. It's just "women who exercise political power," Pereira says, adding that existing laws don't work because they're not implemented effectively. "It takes a lot of effort for justice to be done."

Some mayors, such as Bertha Eliana Quispe Tito, have been prevented from entering their workplaces, been physically attacked, and had their families threatened. Quispe was 27 in 2015 when she became the first female mayor of Collana, a small rural town of some 5,000 people of her Aymara indigenous group. A MAS party member, she says her problems started when she moved to regulate the local limestone mining industry. She was beaten by masked men one night in September 2016 after she left the office. It wasn't a random attack or a robbery.

"They warned me that if I didn't resign, my sisters were going to pay all the consequences, my family," Quispe says. "They said various things: If I didn't quit, they'd burn my father's house, take the cattle." Four of her colleagues in the council were kidnapped to pressure Quispe to withdraw her complaint about the attack. She did, and the four were released, but no one was prosecuted for the kidnappings. The doors of the municipal building where she worked were welded shut and walled up with bricks, forcing her to relocate to another town for her own safety. She is not certain that she'll run for reelection.

The Aymara mayor of El Alto, Soledad Chapetón Tancara, 39, is from the other side of the political spectrum. A member of the National Unity Front, she unseated a male incumbent from the rival MAS party and made tackling entrenched corruption in her city of nearly a million people, the second largest in Bolivia, the cornerstone of her work.

Chapetón considers herself lucky that she was not in the municipal building on February 17, 2016, when an arson attack killed six public officials. She believes she was targeted for her anti-corruption work. Last October, after the disputed presidential election, Chapetón was again attacked because, she says, "many people said that because of me, the MAS lost support in El Alto." The mayor's office was burned, as was the home Chapetón shares with her parents. She has relocated to a temporary office, and her scattered family had to move to several undisclosed locations. She scrolls through her phone, sharing the threats she receives regularly on WhatsApp. Chapetón "has to pay for her sins," reads one. "This bitch is doing all of this ... we will take the mayor's office, most of the areas, to neutralize them," another message says. "We want her to quit!"

Chapetón has no plans to do so. "At no time did I have a moment of doubt," she says. "I knew that I was doing things well." □

Violence against women in politics is so pervasive in Bolivia that a law was passed in 2012 specifically to combat it.

Rania Abouzeid wrote about the rising power of women in Rwanda and around the world in *National Geographic*'s November 2019 issue. **Andrea Bruce** photographed a story about sanitation in August 2017.

A crowd gathers at Venice Beach Skate Park to watch the feats of skateboarders such as Sean Davis, seen here. The 22-year-old moved from Illinois to California last year to pursue dreams of being a pro skater in the sport's epicenter.

BY **ROBERT DRAPER**
PHOTOGRAPHS BY
DINA LITOVSKY

TRAVEL | LOS ANGELES

AIR TIME

How Southern California skateboarding went from fringe sport to worldwide influence on cityscapes and culture

ON A SUNNY MONDAY afternoon at Venice Beach, a tall young man in a T-shirt and baggy pants leaps over the rail of the skate park, drops his skateboard onto the concrete surface, mounts the wood with his left foot, and proceeds to glide along the park's perimeter with increasing speed. He descends into one of the park's two deep bowls, then soars back up and over its far lip. Approaching a platform, he and his skateboard leap onto it—but not before his back foot twirls the board 360 degrees, a move he executes again as he flies off the platform's other end and lands on the pavement.

His name is Sean Davis, and since the age of eight, he has thought of himself as a skateboarder above all else. From Naperville, Illinois, he moved to Los Angeles last year, couch surfing and at times sleeping in his car—all to be here in Southern California, the sport's birthplace.

From a neighborhood hobby to a sport that gained traction in California's surfing scene in the 1950s, skateboarding is now mainstream and global. Its scruffy DIY ethos has swept Shanghai, São Paulo, Helsinki, and even Kabul. Skateboarding has its own language for moves (fakie, vert, kickflip, ollie), founding fathers (including Tony Alva, Steve Caballero, and Tony Hawk), journal of record (the San Francisco-based *Thrasher*), definitive film (the 2001 documentary *Dogtown and Z-Boys,* directed by skateboarding legend Stacy Peralta and narrated by Sean Penn), and

Botticelli's Venus is recast as a skater goddess in Rip Cronk's 2010 mural "Venice Kinesis," one of several public artworks that brighten the Venice Beach boardwalk. Along this famed, approximately 1.5-mile oceanfront stretch, visitors buy souvenirs, rent boards, and drink protein smoothies.

celebrity hobbyists (Justin Bieber, Rihanna, Lil Wayne, Miley Cyrus).

Once regarded—in the words of Ocean Howell, formerly a pro skateboarder and now an associate professor of history—as "a thorn in the side of landscape architects, planners, and building owners," skateboarders today have become unofficial advocates for urban planning and design.

"Governments are now supporting it as a sport, just as they are soccer," says Yulin Olliver, a Los Angeles–based sports agent with Wasserman, which represents several skateboarders.

As the ultimate validation, and in tacit acknowledgment of their need to appeal to a younger audience, the next Olympics plan to include new events: men's and women's street and park skateboarding. The former will take place on a course of stairs, handrails, curbs, and

other urban-style features; the latter in a meandering terrain of hollowed-out dips and bowls.

FOR ALL THE SPORT'S UBIQUITY, skateboarding's ground zero remains its origin point: Southern California. The state's history, from gold miners to tech entrepreneurs, is a repeatedly told tale of reinvention and smashing norms.

The daily spectacle played out at Venice Beach Skate Park is deceptively whimsical, seemingly of a piece with the pickup basketball games and tennis matches a couple hundred yards away. But the skateboarders have more in common with the previous era's bodybuilders such as Reg Lewis and Dave Draper, who epitomized not only the California lifestyle but also its coolly determined ambition. Just as those musclebound beach boys sought to reconfigure the human physique, skateboarders flock to Southern California to carve and pare the lanes of human traffic.

"This is exactly as it's depicted," says pro skateboarder Sebastian "Sebo" Walker, 32, who relocated from Salem, Oregon, more than a decade ago and spent four years sleeping in the back of a van so he could spend his days honing his craft in SoCal skate parks. "Sunny every day, great skateboarders everywhere, a world-famous lifestyle that's very much real."

That pervasively casual lifestyle has been augmented with an upmarket sheen as Venice Beach has become a well-traveled destination. Hordes of visitors now compete with the locals for table space at popular restaurants such as Charcoal Venice, the Tasting Kitchen, and the sleek coffee bar Intelligentsia. But no touristic experience at Venice Beach would be complete without checking out its skateboarding scene.

The basketball court at Pecan Recreation Center, in East L.A., is a skate spot especially popular with beginners, such as Briana King (second from right) and her friends. In the past decade, more girls have taken up skateboarding, and the number of full-time professional women in the sport has doubled.

Skateboarding has stressed individual style since its early days in the Southern California surfer scene. Getting together at Venice Beach is a chance for skaters to show off forward fashion as well as freestyle footwork on their boards.

ASHER
RD MAGAZINE
Continental

The skate park represents the beach's idyllic allure, with its palm trees, gleaming sunsets, and not-yet-fully-gentrified beach vibe. At any given moment, the park's inhabitants reflect the pastime's full spectrum: little kids with hovering parents, rising talents such as Sean Davis, the occasional amply remunerated pro, and teenage aficionados who've found in skateboarding the kind of individualized creative outlet that more established sports cannot offer.

STILL, VENICE'S SKATE PARK is barely a decade old. Santa Monica's park, The Cove, was built in 2005, while West L.A.'s skateboarder haven in Stoner Skate Park opened in 2010. Each has a neighborhood constituency. "It's a brotherhood of sorts and very much territorial," says Jim McDowell, a co-owner of Santa Monica's tiny but evocative skateboarding shop Rip City Skates, founded in 1978 in a former bar. "The Venice Beach guys said 'screw you' to the Santa Monica guys, and vice versa."

The skate parks of Southern California—now influencing public spaces all over the world—are themselves copies of denuded urban thoroughfares. They emulate the outlaw tradition of skateboarding as a reimagination of staid, orderly cityscapes. Staircases, park benches, guardrails—they're all there to be skated on. "Skateboarding is about bending the rules," says Steve Alba, a legend in the sport for over four decades. "It's an us-against-them mentality."

Salba (as he's known), now 57, was among the second wave of pioneering skateboarders after the Z-Boys, so named for the Zephyr surfboard shop in Santa Monica that they frequented. He helped popularize vertical, or "vert," skateboarding during the 1970s, when a severe drought in Southern California kept many residents from filling their swimming pools.

The deep bowls in today's custom-designed skate parks are modeled after the private pools that Salba and his gang used to sneak into, merrily launching their daredevil sky-bound tricks before the police came.

One winter morning outside a residence in San Bernardino County, I watch Salba and some half dozen younger skaters ply their trade in a drained pool that the owner agreed to let them use. Two of them are superstars in the genre: Oskar "Oski" Rozenberg, a 23-year-old Swedish dynamo widely understood to be among the most inventive skaters in the world; and 22-year-old Tristan Rennie, a San Bernardino County native possessed of mentholated calm.

An icon in the global skateboarding community, Santa Monica's Rip City Skates has been supplying gear since 1978. "Many times, kids get off the plane and before they go to the hotel, they come here," says co-owner Jim McDowell (pictured).

For an hour they take turns whirling and grinding, floppy-haired gladiators on wheels in a backyard Colosseum saluting each other's tricks with choruses of "Sick, dude!" and "That's rad, bro!" Salba zooms down into the pool with them. He wears a helmet—always red—as well as matching leopard-skin pads on his elbows and kneecaps, and is noticeably stiffer of gait. Still, the younger skaters look on Salba with reverence. Through various sponsorships, mentorships, video sales, and apparel deals, not to mention his continued activity in pools throughout the so-called Badlands of Los Angeles and San Bernardino Counties, Salba has managed to pull off the most complicated skateboarding trick of all. He has made a career out of this.

"It's cool to see this new generation hearkening back to the old ways," the veteran says. "Like Oski. He doesn't get to do this [skate pools] much in Sweden … But this is what skateboarding's about—not letting things get in your way."

Sean Davis knows all about not letting things get in his way. He waits tables at a steakhouse in Santa Monica, to which he skates from the Venice Beach Skate Park some mornings and then back to the park when he clocks out in midafternoon. Once it's dark, Davis logs on to his computer and posts videos of his latest feats—a good-natured Midwestern dude seeming to fly on a slab of wood directly into the maw of the setting sun—to his more than 12,000 followers on Instagram. At night he dreams of new tricks to execute. He jumps rope in the morning, lifts weights, and does yoga. He visits a local CBD shop to buy a cannabis-derived lotion to treat the pain endemic to a sport that involves flinging one's unprotected self into a concrete bowl. He has broken an ankle, an elbow, a wrist, a finger, a thumb, a toe, and a relationship with the girl who made the move with him from Illinois to California.

His dedication to the sport is total. Davis has accumulated a handful of sponsors, including Nike, though for the most part the rewards are free gear. He would like to be a professional, to skate for a living, perhaps even start a line of skateboard-oriented clothing. For now, Davis is focused on a singular quest: "to fulfill my childhood dream of seeing my name on a board."

It is not so wild a fantasy. The renegade nature of the sport has long been on a collision course with its widespread commercial potential—which arguably began with the release of Tony Hawk's first of several skateboarding video games in 1999.

Olympic status has now conferred on it a legitimacy that from certain angles appears awkward. For a sport that prioritizes individual style above all else, how competitors like Tristan Rennie will fare under the mantle of Olympian uniformity is anyone's guess. ("I mean, what *is* the training we're supposed to be doing?" Rennie asks.)

"There's a lot of tension," Salba acknowledges. "Now personally, I think being in the Olympics is awesome. That being said, the Olympics needs skateboarding way more than skateboarding needs the Olympics."

TWO HOURS BY CAR south of Venice Beach in the oceanside town of Encinitas, I find 16-year-old Bryce Wettstein in her backyard, negotiating the deep curves of her personal skate ramps, named the Iguana Bowl after the family's deceased pet iguana.

As a teenager, Wettstein cuts a familiar figure: giggly, chronically tongue-tied, a bit clumsy. But she becomes a titan when she mounts a board, either in the Pacific Ocean or on concrete. From age five, she surfed and skated, and by eight did both of them competitively, unable to choose a preference—until about three years ago, when it dawned on her that reacting to nature on a wave did not fully tap into her creative impulses the way riding a skateboard did.

Plus, says Wettstein, "in surfing, you are greatly at the luck or mercy of Mother Nature." In 2019 she achieved distinction as the U.S. women's national champion in park-format skating. Wettstein is a female standout in what has been, since its inception, a sport fueled by testosterone swagger. That fact presents opportunities for women, as well as challenges.

"On the men's side, there's an ocean of talent, so it's harder for any one male to rise up and break through the noise," says Wettstein's agent, Yulin Olliver. "On the other hand, the sponsorship and contest deals offered to women are so small, you have to piece a lot of them together."

According to Olliver, there are fewer than a dozen women in the U.S. who can claim skateboarding as a full-time job—and none of them are getting rich off skateboarding sponsorships.

Wettstein, for her part, is still in school. Her immediate concern is not financial viability but the possibility of being disenrolled for missing too many school days while traveling to contests in Brazil, Sweden, Peru, and China.

Jose A. Rendon carves a ramp at Venice Beach, where dreams of glory may lead to pro competitions and corporate sponsorship. But according to Rip City Skates' McDowell, the true skater kid doesn't care about those accolades: "They just want to skate."

And she hopes to qualify for the Olympics. If sailing through the air on a wheeled wooden board is a Californian's ultimate fantasy, then the world of medal platforms and national anthems is a dream on another scale entirely.

The skateboarders of Southern California are architects on wheels, endlessly redefining their sun-bleached urban landscape. To watch them pursue their now Olympian sport on Venice Beach—ledge-grinding and kickflipping down paths all their own—is to witness something as timeless as the Pacific waves: the human impulse to defy the natural laws of the universe. And, of course, to look cool while doing it. ▯

Robert Draper has been a contributing writer for *National Geographic* since 2007. **Dina Litovsky** last photographed girls in science fairs for the November 2019 Women's Issue.

Travel Wise: Southern California

VENICE BEACH

Once a gritty enclave, this hub of L.A. skateboarding is now a melting pot of quintessential SoCal urban life. At restaurants and coffee shops along Abbot Kinney Boulevard, yogis and vegans rub elbows with "Silicon Beach" techies and Hollywood A-listers. But Ocean Front Walk remains the beloved bohemian free-for-all Venice is famous for, complete with charismatic street stars like rollerblading guitar player Kama Kosmic Krusader.

SANTA MONICA

Venice's neighbor to the north buzzes day and night. Retail chain stores, restaurants, and bars line car-free Third Street Promenade. Santa Monica Pier appeals to all with carnival-style action and a signature solar-powered Ferris wheel.

ENCINITAS

A two-hour drive from L.A. connects travelers to this wealthy, laid-back coastal town in San Diego's North County. Formerly known for poinsettia farming, Encinitas still blooms with plenty of gardens for strolling. But these days, bluff-bordered beaches, with names like Swami's and Moonlight State Beach, are the main attraction.
—Anne Kim-Dannibale

CHRISTINE FELLENZ, NGM STAFF. SOURCES: CITY OF LOS ANGELES DEPARTMENT OF RECREATION AND PARKS; LOS ANGELES COUNTY DEPARTMENT OF PARKS AND RECREATION; OPENSTREETMAP

INSTAGRAM

DIANA MARKOSIAN

FROM OUR PHOTOGRAPHERS

WHO

Markosian is a conceptual and documentary photographer based in London, England.

WHERE

The courtyard of a church on the outskirts of Havana, Cuba

WHAT

A Canon EOS 5D Mark IV camera with a 24mm f/1.4L II lens

Markosian spent a month in Cuba to photograph transitions, and specifically the ritual of a young woman's *quinceañera*. The Latin American tradition marking a girl's 15th birthday as a passage to womanhood dates back to French debutante balls introduced to Mexico in the mid-19th century. Today many quinceañeras are special occasions with glitzy parties for entire communities, and some families complement the festivities with elaborate glamour-photo sessions. Friends are a large part of a quinceañera. Markosian captured this image of teenagers in a church courtyard outside Havana, as they waited with about a hundred other guests for the start of their friend's celebration.

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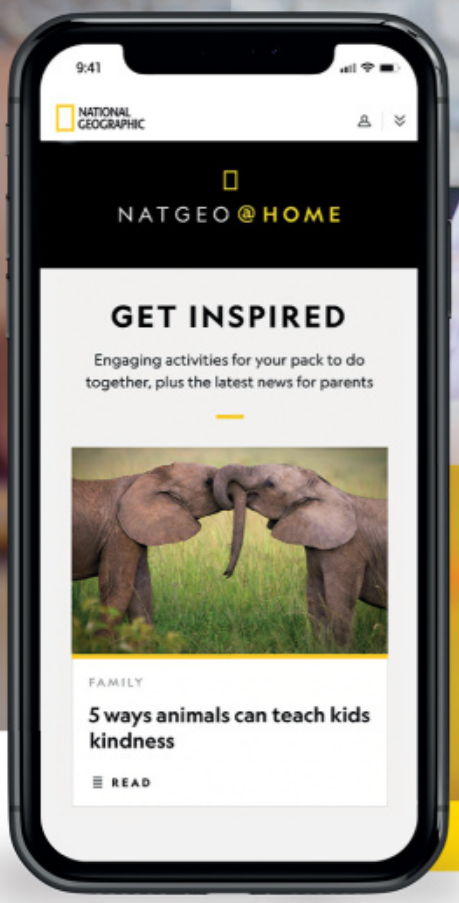

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